

2008

The relationship between nicotine dependence and symptoms of anxiety, depression and stress in a therapeutic community for alcohol and other drug rehabilitation

Thomas Hopkins
Edith Cowan University

Follow this and additional works at: https://ro.ecu.edu.au/theses_hons



Part of the [Health Psychology Commons](#), and the [Substance Abuse and Addiction Commons](#)

Recommended Citation

Hopkins, T. (2008). *The relationship between nicotine dependence and symptoms of anxiety, depression and stress in a therapeutic community for alcohol and other drug rehabilitation*. https://ro.ecu.edu.au/theses_hons/1101

This Thesis is posted at Research Online.
https://ro.ecu.edu.au/theses_hons/1101

Edith Cowan University

Copyright Warning

You may print or download ONE copy of this document for the purpose of your own research or study.

The University does not authorize you to copy, communicate or otherwise make available electronically to any other person any copyright material contained on this site.

You are reminded of the following:

- Copyright owners are entitled to take legal action against persons who infringe their copyright.
- A reproduction of material that is protected by copyright may be a copyright infringement. Where the reproduction of such material is done without attribution of authorship, with false attribution of authorship or the authorship is treated in a derogatory manner, this may be a breach of the author's moral rights contained in Part IX of the Copyright Act 1968 (Cth).
- Courts have the power to impose a wide range of civil and criminal sanctions for infringement of copyright, infringement of moral rights and other offences under the Copyright Act 1968 (Cth). Higher penalties may apply, and higher damages may be awarded, for offences and infringements involving the conversion of material into digital or electronic form.

USE OF THESIS

The Use of Thesis statement is not included in this version of the thesis.

COPYRIGHT AND ACCESS DECLARATION

I certify that this thesis does not, to the best of my knowledge and belief:

- (i) incorporate without acknowledgement any material previously submitted for a degree or diploma in any institution of higher education;
- (ii) contain any material previously published or written by another person except where due reference is made in the text; or
- (iii) contain any defamatory material.

Signed.....

Date.....20/1/09.....

**EDITH COWAN UNIVERSITY
LIBRARY**

The Relationship between Nicotine Dependence and Symptoms of Anxiety, Depression
and Stress in a Therapeutic Community for Alcohol and other Drug Rehabilitation

Thomas Hopkins

A Report Submitted in Partial Fulfilment of the Requirements for the Award of
Bachelor of Arts (Psychology) Honours, Faculty of Computing, Health and Science,
Edith Cowan University.

Submitted (October, 2008)

I declare that this written assignment is my own work and does not include:

- (i) material from published sources without proper acknowledgement or,
- (i) material copied from the work of other students.

Signature: _____

Date: _____

Declaration

I certify that this literature and research project does not incorporate, without acknowledgement, any material previously submitted for a degree or diploma in any institution of higher education and that, to the best of my knowledge and belief, it does not contain any material previously published or written by another person except where due reference is made in the text.

Signature: _____

Date: _____

Acknowledgements

I would like to thank Cyrenian House for giving me permission to ask the residents of the Therapeutic Community to participate in my study and for allowing me to use program time to present my study to the residents. I would also like to thank all of the residents of the Therapeutic Community that participated in my study.

Acknowledgements

I would like to thank Cyrenian House for giving me permission to ask the residents of the Therapeutic Community to participate in my study and for allowing me to use program time to present my study to the residents. I would also like to thank all of the residents of the Therapeutic Community that participated in my study.

Table of Contents

LITERATURE REVIEW.....	1
Abstract.....	2
Introduction.....	3
Literature Review.....	5
Conclusion.....	20
References.....	24
RESEARCH REPORT.....	32
Abstract.....	33
Introduction.....	34
Mental Health Effects of Smoking.....	34
Smoking Cessation Interventions.....	37
Factors Affecting Intervention Success.....	38
Smoking Interventions and Alcohol and Other Drug Treatment.....	40
Smoking in the Therapeutic Community for AOD Treatment.....	42
Method.....	43
Design.....	43
Materials.....	44
Fagerstrom Test for Nicotine Dependence.....	44
Depression Anxiety and Stress Scale.....	44
Participants.....	45
Procedure.....	45
Correlational Analysis.....	45

Results.....46

 Group Comparison Analysis.....46

 Table I.....48

Discussion.....49

References.....59

Appendices.....66

Smoking, Mental Health, and Alcohol and Other Drug Treatment: A Review

Thomas Hopkins

Smoking, Mental Health, and Alcohol and Other Drug Treatment: A Review

Abstract

Smoking tobacco is the largest single risk factor for premature death in developed countries. It is also associated with the greatest economic cost of all drugs in Australian society. In addition to the health and economic consequences associated with smoking, it has also been associated with mental health problems. Smoking has been associated with anxiety, depression and stress, as well as more pervasive disorders such as panic disorder and agoraphobia. It is not clear whether smoking contributes to mental health problems or individuals with mental health problems smoke to alleviate symptoms. It may be there are genetic factors that contribute to both. The various forms of smoking cessation interventions include nicotine replacement therapies (NRT), brief interventions, telephone counselling, self-help materials, banning smoking in certain areas, and individual counselling or group therapy. Research suggests that combinations of NRT for extended periods of time is the most effective smoking cessation intervention. Rates of smoking remain high amongst people with alcohol and other drug use disorders. Mortality rates from smoking are much higher for these individuals compared to the general community. Despite smoking cessation not being encouraged for those in treatment for alcohol and other drug use, research suggests that treating smoking for these individuals does not put at risk other drug treatment and may actually improve treatment outcomes. The "stages of change" model theorises that smokers are in one of five stages of readiness to change their smoking behaviour at any one time. There are also ten different processes that people use to progress through the stages. A large body of research supports the "stages of change" model. There appears to be little research on smoking and stages of change amongst alcohol and other drug treatment populations. The high mortality rate resulting from smoking for this population warrants further research.

Author: Thomas Hopkins

Supervisors: Dr Deborah Gardner

Dr Shelley Beatty

Submitted: October, 2008

Introduction

The relationship between smoking tobacco and chronic health problems is well established (Bergen & Caporaso, 1999). Various health problems such as cancer of the lungs, oesophagus, cervix, anus, throat and bladder, as well as an increased risk of heart disease and stroke are only some of the problems associated with smoking (Ryder Salmon & Walker, 2001). In addition, smoking is the largest single risk factor for premature death in developed countries (WHO, 2007). The costs of tobacco use goes beyond just health problems in society. A recent report found tobacco use to be associated with the greatest economic cost in society when compared to alcohol and illicit drugs (Collins & Lapsley, 2007).

Less appears to be known about the relationships between smoking and mental health problems. Nonetheless, the rates of smoking have been found to be higher amongst psychiatric patients than in the general community (Hughes, Hatsukami, Mitchell & Dahlgren, 1986). Smoking has also been found to have strong associations with depression (Kinnunen, Haukkala, Quiles, Spiro & Garvey, 2006; Williams & Ziedonis, 2004), anxiety (West & Hajek, 1997) and stress (Parrot, 1993).

In addition to anxiety, depression and stress, smoking has also been found to be associated with other drug dependencies (Williams & Ziedonis, 2004). In a study by Breslau et al. (1996), it was found that smoking and alcohol dependency were significantly associated in the population samples. The rates of smoking among individuals with substance use disorders have been found to be double to triple that of the general community (Batel, Pessione, Maitre & Rueff, 1995). In addition, many of the individuals that are successfully treated for their drug dependencies will experience a reduced quality of life and longevity due to smoking (Hurt et al., 1996). Indeed it is tobacco (not alcohol or illicit drugs) that has been found to be the leading

cause of death among former patients of a community addictions treatment program (Hurt et al.). In contrast to the commonly held belief among addiction treatment programs that attempting to quit smoking whilst being treated for drug addiction may jeopardise effective treatment, there are some findings that suggest that including smoking cessation interventions in addiction treatment programs may actually improve treatment outcomes (Bobo, McIlvain, Lando, Walker & Leed-Kelly, 1998).

The psychoactive ingredient in tobacco is nicotine, which is a CNS stimulant (Ryder et al., 2001). It has been found that nicotine increases the levels of the neurotransmitter dopamine in the part of the brain that regulates feelings of pleasure (Epping-Jordan, Watkins, Koob & Markou, 1998). Nicotine has been found to contribute to dependence which results in physical and neurobiologic withdrawal symptoms on cessation (Epping-Jordan et al., 1998).

A number of different smoking intervention strategies have been found to be effective in aiding smoking cessation. The various forms of nicotine replacement therapies that have been found to be effective are the transdermal patch, nasal spray, inhaler, chewing gum, tablet or lozenge (Silagy, Mant, Fowler & Lodge, 1994). This enables the smoker to reduce the withdrawal symptoms whilst giving up smoking. Other strategies used in the cessation of smoking include brief interventions, telephone counselling, self-help materials, banning smoking in certain areas, and individual counselling or group therapy (Fitchenburg & Glantz, 2002; Foulds et al, 2006; Hajek, Taylor & Mills, 2002; Murray et al., 2008; Pan, 2006).

Prochaska and Velicer (1997) posited that a smoker is in one of five stages of change at any given time. The five stages of change are precontemplation, contemplation, preparation, action, and maintenance. The stage of change an individual is in has been found to influence their relative success at smoking cessation

(DiClemente et al., 1991). In addition to the five stages of change, Prochaska and Velicer also identified 10 processes of change which an individual uses at different stages. These processes are consciousness raising, self-liberation, social-liberation, self-reevaluation, environmental reevaluation, stimulus control, counterconditioning, dramatic relief, contingency management, and helping relationships.

The purpose of this paper is to review the literature on smoking and mental health, the various smoking cessation interventions, the research regarding smoking and smoking cessation amongst drug treatment populations, and the findings regarding smoking cessation and the stages of change model. The paper will begin with some recent findings on the societal costs of tobacco use in Australia, as well as some recent statistics on the mortality and morbidity attributable to tobacco use in Australia. This will be followed by a review of the various findings on the association between tobacco and mental health as well as the findings regarding smoking cessation strategies. Following this will be a review on the various findings regarding smoking cessation in drug addiction treatment settings, as well as a look at the findings regarding the influence of an individual's stage of change on their smoking cessation success.

Literature Review

The costs of tobacco use in Australia are not just limited to the large number of deaths caused every year. Collins and Lapsley (2007) have outlined the total social costs, in an economic sense, of drug abuse in Australia. They define economic costs of drug abuse as "the value of the net resources that in a given year are unavailable to the community for consumption or investment purposes as a result of the effects of past and present drug abuse, plus the intangible costs imposed by this abuse" (Collins & Lapsley, 2007, p. 2). Of the total social cost of drug abuse in Australia in 2004/05,

tobacco accounted for \$31.5 billion, which was 56.2 percent (Collins & Lapsley).

Alcohol was the next highest at \$15.3 billion and all illicit drugs together accounted for \$8.2 billion. Probably the most frightening finding by Collins and Lapsley was that regarding involuntary smoking by Australian youth. The term involuntary smoking referred to passive smoking as well as the effects of smoking on an unborn child. It was found that for children under 15 years of age in 2004/05, involuntary smoking accounted for 25 percent of deaths, 96 percent of hospital bed-days and 91 percent of hospital costs. These deaths and hospital admissions resulted from conditions such as lower respiratory tract infections, Crohn's disease, ulcerative colitis, antepartum haemorrhage, low birthweight, SIDS, asthma, otitis media, as well as fire injuries. Tobacco use accounted for 14, 901 involuntary and voluntary deaths of people aged fifteen years and over.

There appears to be relationships between the amount an individual smokes and anxiety and depression. In a study that looked at these relationships in teenagers, it was found that participants who reported high levels of depression and anxiety were twice as likely to be smokers after controlling for potential confounds (Patton et al., 1996). Moreover, regular smokers were almost twice as likely as occasional smokers to report high levels of anxiety and depressive symptoms. This finding indicates that there may be relationships between level of nicotine dependence and anxiety and depression. Goodman and Capitman (2000) also found that current tobacco use among teenagers was a powerful determinant of developing a high level of depressive symptoms.

Some findings suggest that even occasional smoking among adolescents can contribute to mental health symptoms. In a study on anxiety and depressive symptoms among adolescent smokers, Dudas, Hans and Barabas (2005) found there to be a

significant difference between occasional smokers and regular smokers. Occasional smokers were defined as those who smoke on some days but not everyday and regular smokers were defined as those who smoke at least once a day. Those who were regarded as occasional smokers were found to exhibit higher levels of anxiety on state as well as trait measures, compared to their non smoking peers. Regular smokers were found to show higher levels of depression than either occasional smokers or their non smoking peers. Similar findings were found by Breslau, Kilbey and Andreski (1992) who found that depression was more strongly associated with heavy smoking and nicotine dependence than lower levels of use. These findings suggest that even occasional smoking can have an effect on mental health and that heavier smoking may be more associated with depressive symptoms.

In addition to depression and anxiety, smoking has also been found to be associated with more pervasive mental health disorders. Heavy smoking of tobacco during adolescence has been associated with an increased risk of developing agoraphobia, generalised anxiety disorder, and panic disorder during early adulthood after controlling for age, gender, difficult childhood temperament; alcohol and other drug use; anxiety and depressive disorders during adolescence; and parental smoking, educational level, and psychopathology (Johnson et al., 2000).

In a study by Parrot (1993) it was found that although smokers experienced a self-reported decrease in stress after smoking cigarettes, they experienced higher general levels of stress than non-smokers. It was also found that after smoking cessation, smokers' general levels of stress were reduced. These findings suggest that smoking may contribute to increased stress levels in smokers.

It has been suggested that there is a causal link between depression and smoking. This link appears to go in both directions. For example, depression may

result from the neurochemical changes caused by smoking, and in contrast, individuals with depression may self-medicate the negative feelings by smoking (Carmody, 1989; Gilbert, 1979). A twin study conducted by Kendler et al. (1993) found there to be higher rates of smoking and major depression in the co-twins of identical twins than in the co-twins of fraternal twins, suggesting that there may be genetic factors that predispose individuals to smoking and major depression. Evidence also suggests that it is only current smoking that is associated with depressive symptoms. A study of depression and smoking in men over 25 years conducted by Kinnunen et al. (2006) found that current smokers scored significantly higher on depression scales than quitters, those who have never smoked and former smokers. Interestingly, it was also found by Kinnunen et al. that none of the depression measures predicted smoking cessation. Smokers with higher depression scores were just as likely to give up smoking as those with lower scores.

Mental health disorders also appear to be associated with the maintenance of smoking because of the effect from the withdrawal of smoking. In a study on nicotine withdrawal symptoms among individuals with psychiatric disorders it was found that individuals with histories of major depression or any anxiety disorder reported more severe nicotine withdrawal symptoms than those with no history of either disorders (Breslau et al., 1992). This finding is consistent with a study by Covey, Glassman and Stetner (1990), in which it was found that smokers with histories of major depression experienced more psychological distress, anger, and other disturbances that characterise withdrawal than those without such histories. Interestingly, Breslau et al. (1992) found that a history of any anxiety disorder, but no history of alcohol or other drug disorder, was associated with more severe nicotine withdrawal. This finding

suggests that smoking cessation attempts may not put at risk recovery from alcohol and other drug use.

The more severe withdrawal symptoms experienced by individuals with anxiety and depressive disorders may influence their success at cessation attempts. A study by Glassman et al. (1988) found that smokers who had a history of major depressive disorder failed at twice the rate of those without, even though they were not depressed at the time. Similar findings were found by Pomerleau, Adkins and Pertschuk (1978) when they demonstrated that smokers who identified negative affect as a reason for smoking were more likely to fail in their cessation attempts. Negative affect was a broad concept used in the earlier studies on smoking referring to states such as depressed mood, anxiety, tension and/or anger (Glassman, 1993).

Due to the many negative consequences associated with smoking, many smoking cessation intervention strategies have been developed throughout the years. Nicotine replacement therapies (NRT) work by replacing the nicotine delivered by cigarettes so as to reduce the negative affect associated with nicotine withdrawal (Gold, Ruby & Harvey, 2002). In a meta-analysis on the efficacy of NRT for smoking cessation conducted by Silagy, Mant, Fowler and Lodge (1994), it was found that NRT were effective in aiding smoking cessation. However, all forms of NRT were associated with a high relapse rate suggesting that minimising relapse is important if long-term smoking cessation is to be maintained. Other studies have shown NRT as well as bupropion hydrochloride (referred to as bupropion) as being effective smoking cessation strategies (Gold et al.; Jorenby, 2001). Bupropion is an anti-depressant that works on the central nervous system to reduce the withdrawal symptoms during smoking cessation (Gold et al.).

There is also evidence to suggest that using combinations of medications for smoking cessation can be effective. Some studies have shown combinations of NRT to be more effective when compared with an NRT on its own (Croghan et al., 2003; Fagerstrom, Schneider & Lunell, 1993). A study by Steinberg, Foulds, Richardson, Burke and Shah (2006) which assessed the efficacy of combinations of medications for smoking cessation found that the use of combinations of medications was associated with a higher likelihood of remaining abstinent. Although this trend reduced somewhat over time, a six month follow-up indicated that it was continuing. Interestingly, those who received combinations of medications were assessed as being more nicotine dependent at the beginning of the study, but they still did as well as less dependent smokers at both follow-ups. Steinberg et al. also found that longer duration of medication use was associated with better outcomes. It was found that those that continued to use medications had considerably better abstinence rates at six months.

In recent years, doctors have been encouraged to routinely offer smoking cessation advice to all presenting patients who are smokers (Mullins, Livingston & Borland, 1999; Murray et al., 2008). The findings on the effectiveness of this approach are mixed. Murray et al. found that proactively identifying smokers who wanted to quit in primary care populations and referring them to a cessation service increased contacts with cessation services and the number of quit attempts. However, it was found that at the population level there was no significant impact on actual quit rates or reported cigarette consumption. Hajek, Taylor and Mills (2002) found that a single session brief intervention to prevent cardiac inpatients from returning to smoking after discharge was ineffective. The researchers concluded that single session brief interventions are insufficient to influence highly dependant smokers to quit. A study conducted by Butler, Pill and Stott (1998) on patients' perceptions of doctors'

advice to quit smoking found that many patients were sceptical about the influence of doctors' words on their smoking habits, making the point that the negative effects of smoking are already well known. In addition, patients who were not ready to quit reported shrugging it off, feeling guilty, getting annoyed, or changing their help seeking behaviour, when being advised to quit. Two patients even reported putting their health at risk by not attending for needed medical help because they feared being talked to about their smoking. It was also found, however, that the patient's receptiveness to advice depended largely upon how the advice was delivered. Interventions that patients found acceptable were those conveyed in a respectful tone that was not preaching, showed support and caring, and attempted to understand them as a unique individual. Stott and Pill (1990) had similar findings from their study on the effect of doctor's advice. This suggests that the manner in which advice is given by doctors is equally as important as the advice itself.

In a systematic review of the effect of smoke-free workplaces on smoking behaviour, it was found that totally smoke-free workplaces were associated with reductions in prevalence of smoking of 3.8% (Fichtenburg & Glantz, 2002). In addition, smoke-free work places were also associated with smokers smoking 3.1 fewer cigarettes per day. It was estimated by the authors that if all workplaces became smoke free in the United States and the United Kingdom, consumption per capita in the entire population would drop by 4.5% in the United States and 7.6% in the United Kingdom. This study demonstrated the strong effect that smoking restrictions can have in reducing rates of smoking.

In a meta-analysis on proactive telephone counselling as an adjunct to minimal intervention for smoking cessation conducted by Pan (2006), it was found that proactive telephone counselling is effective as an adjunct to other minimal

interventions for younger, male, light-smoking individuals. Minimal interventions were defined as a single or combination of less intensive or self-help interventions such as nicotine replacement therapy, reactive telephone hotlines or helplines, computer programs or the internet, and physician's advice. The results of the meta-analysis indicated that researchers and health care providers may need to focus on the individual as much as on the intervention process to provide effective interventions. This means that smoking interventions should take into account the characteristics of the individuals that they will be delivered to and be developed accordingly.

There is evidence to suggest that an individual's success at smoking cessation can depend on their level of nicotine dependence. Foulds et al. (2006) found that the measure of how long an individual takes to smoke after waking in the morning was predictive of their smoking cessation outcome. After having controlled for other predictors, those participants who usually smoked more than 30 minutes after waking in the morning were twice as likely to succeed at quitting than those who smoked within five minutes of waking. How long an individual takes to have their first cigarette for the day is generally a marker of nicotine dependence, so this finding suggests that an individual's level of nicotine dependence has a bearing on their cessation attempts. Other studies have reported similar findings on cessation success and time of first cigarette for the day (Harris et al., 2004; Hymowitz et al., 1997; Judge et al., 2005). For example, Foulds et al. found that those participants who sometimes woke in the night to have a cigarette or use tobacco were significantly less likely to remain abstinent at six month follow-up, after controlling for other predictors. This is also a marker of nicotine dependence and further supports the concept that smoking cessation success depends on an individual's level of nicotine dependence.

Socioeconomic status has also been found to be a predictor of success at smoking cessation. Foulds et al. (2006) found that participants with only a high school education were significantly less likely to have remained abstinent at both follow-up periods compared with participants who had a university degree. In addition, being unemployed predicted a poor outcome at four weeks follow-up, and not having private health insurance predicted a poor outcome at 26 week follow-up. The researchers suggested that the effect of socioeconomic background on outcomes is a result of the social environment of those with a lower socioeconomic background. For example, those with a lower socioeconomic background are less likely to work in smoke-free environments and are more likely to have friends and family who smoke.

Due to many factors, smoking has declined in developed countries in recent years (WHO, 2007). Despite this, there has been no significant reduction in smoking among individuals with substance use disorders (Kalman, 1998). Indeed, many drug treatment counsellors discourage clients from quitting smoking in early stages of treatment (Brigham, Schroeder & Schindler, 2007). One reason that smoking cessation is not advocated by drug treatment programs is that there is a concern that this could deter some individuals who are willing to address their other substance use problem but not their smoking (Bobo, McIlvain, Lando, Walker & Leed-Kelly, 1998).

Another reason is the belief that encouraging smoking cessation during drug treatment could jeopardise effective treatment (Campbell, Wander, Stark & Holbert, 1995).

Contrary to this commonly held belief, the research suggests that smoking cessation does not risk successful substance use treatment. A study by Martin et al., (1997) in which 205 recovering alcoholics were assigned to one of three smoking cessation groups found that at 12-month follow-up, only 4% of all participants had relapsed to use alcohol or other drugs. However, the lack of a non smoking cessation control

group limited the study. Further support for these findings came from a study conducted by Burling, Marshall and Seidner (1991) in which 39 inpatient alcohol dependent men were randomly assigned to a tobacco intervention or waitlist control group. No adverse effect was found for the tobacco intervention group as compared to the waitlist control group. In addition, Bobo et al. (1998) from their study of a randomised controlled trial community intervention involving 575 individuals from 12 residential treatment programs had a primary finding that urging alcohol dependant individuals to quit smoking does not compromise treatment, even in early stages of recovery. No adverse effect was detected on participants being able to remain abstinent after treatment discharge. It was actually found that the likelihood of remaining abstinent for those who were repeatedly encouraged to quit smoking was almost twice that of the control group over the one year follow-up. The researchers attributed the more favourable outcomes for those exposed to the tobacco intervention to a number of factors. It was likely that some of the aspects from the tobacco counselling reinforced key elements of effective alcohol treatment. In addition, the counselling sessions encouraged personal responsibility and supported a drug-free lifestyle, messages which may have generalised back to alcohol. The study was limited by the fact that all study data, apart from the analysis of saliva samples, were gathered via self-report. However, the researchers suggested that was unlikely to bias their primary finding as they were unable to detect evidence of differential reporting between intervention and control groups. This is an interesting finding and is contrary to what is believed throughout the addictions field.

A number of studies have demonstrated the harm of tobacco use among alcohol and other drug dependant individuals. In an 11-22 year follow-up study of 845 individuals treated for drug dependency conducted by Hurt et al. (1996), it was found

that those treated for drug dependency had a mortality rate almost three times that of the general community of the same age. Interestingly, the majority of deaths were not a result of the drugs that they were treated for but were attributed to conditions resulting from tobacco use such as lung cancer and heart disease. Another study conducted by Hser, McCarthy and Anglin (1994) found that opiate addicts who smoked had a mortality rate four times that of opiate addicts who did not smoke at 21-24 year follow-up. In addition, it was found that the relapse rate amongst the survivors who did not smoke was less than that of the survivors who continued to smoke. However, because Hser et al.'s data was based on observational, retrospective data, they did not know whether smoking cessation occurred around the time of treatment or years later.

Not all research suggests that smoking cessation does not jeopardise effective drug treatment. There is also evidence suggesting that smoking cessation can have a detrimental effect on alcohol and other drug treatment. Conner, Stein, Longshore and Stacey (1999) found that the introduction of a mandatory smoking abstinence policy for polydrug users in treatment resulted in an increase in cocaine use. It was suggested by the researchers that tobacco had likely served as a replacement for cocaine previous to the ban. Other studies have also found that individuals in drug treatment increase their tobacco use as a replacement drug (Campbell et al., 1995). However, the majority of research reviewed suggests that smoking cessation does not jeopardise alcohol and other drug treatment and may actually improve treatment outcomes.

The "stages of change" model was developed from observations of how people quit smoking on their own and has proven to be effective in the development of smoking cessation interventions (Prochaska, DiClemente, Velicer & Rossi, 1993). Originally developed for quitting smoking, the model can be used for any behaviour

change, in particular in the field of alcohol and other drugs (Ryder, 1999). The five stages can have a bearing on how successful an individual will be quitting smoking or changing any other kind of behaviour (Prochaska & Velicer, 1997). People in precontemplation are not intending to quit smoking in the near future, usually measured as the next six months. Individuals in the precontemplation stage may be underinformed of the full extent of the consequences of their behaviour or may be demoralised after failed attempts at behaviour change in the past. The latter is more likely the case for smokers who are in precontemplation. Precontemplators are resistant and are not ready for any interventions. People in the contemplation stage are intending to quit in the next 6 months. They are more aware of the benefits of changing their behaviour than people in precontemplation but are also very aware of the costs. People in contemplation to be in a state of ambivalence and people can be in the contemplation stage for a very long time. They are typically not ready for action-oriented interventions. People in the preparation stage are intending to quit in the immediate future; usually measured as in the next 30 days. Generally these people have taken some form of action over the past year, and usually have a plan of action such as having sought counselling, consulted their physician, or bought a self-help book. People in the action stage have stopped smoking within the last 6 months.

When the model is applied to smoking, only complete abstinence qualifies as being action. Simply cutting down on the number of cigarettes or switching to lower tar or nicotine brands does not qualify as being action. This is because there is no safe level of use for tobacco (WHO, 2007). People in the maintenance stage are in the process of preventing relapse but do not have to focus on maintaining their change as much as those in action. The temptation to relapse becomes less and less for those in maintenance and they become increasingly confident that they can continue with their

changed behaviour. It is estimated that people can be in the maintenance stage from anywhere between six months and five years. Although not formally a stage in the model, relapse is an expected part of the progression through the stages. However, individuals would rarely relapse all the way back to precontemplation. Usually relapse would take people back to contemplation or preparation.

In addition to the five stages of change, Prochaska and Velicer (1997) identified ten covert and overt processes that people use as they progress through the stages. The covert, internal processes are associated more with the early stages of change and the more overt, behavioural processes are associated more with the later stages of change. Consciousness raising is the process by which an individual becomes more aware of the consequences associated with their behaviour. An individual would likely go through this process in precontemplation. Dramatic relief is the process where by an individual has an emotional experience related to their behaviour. For example, an individual may have a family member who dies as a result of a smoking-related illness which may trigger that person to move from precontemplation to contemplation. Self-reevaluation involves an individual assessing themselves, both cognitively and affectively, with and without the behaviour they want to change. This process usually occurs in the contemplation stage. Environmental-reevaluation involves an individual making a cognitive and affective assessment of the impact that their behaviour is having on their social environment, such as the effect of smoking on others. This process usually occurs in the precontemplation or contemplation stages. Self-liberation is the process whereby an individual begins to believe in their ability to change and the commitment to act on that belief. Commonly referred to as willpower, this process generally occurs in the preparation stage. Social liberation is the process whereby an individual's social environment provides more of

an opportunity for the behaviour change. Smoke-free workplaces are an example of social-liberation. Counterconditioning involves the replacing of the unwanted behaviour with new healthy behaviours. For example, doing exercise as a replacement for a morning cigarette. This process would generally occur in the action stage. Stimulus control is the process whereby an individual removes stimuli from the environment that may prompt a relapse to the changed behaviour. For example, someone who has just given up smoking would benefit from throwing out all ashtrays and lighters. This is typically an action process. Contingency management is the process whereby an individual treats themselves for reaching certain goals in their behaviour change. For example, someone who is stopping smoking could use the money saved from cigarettes to buy something they want as a reward. This is also typically an action process. The final process, helping relationships, involves establishing a network of supportive people that can help maintain the desired change. A counsellor can be an example of a helping relationship. This is also an action process.

Many research findings support the “stages of change” model for smoking cessation. A study conducted by DiClemente et al. (1991) analysed the accuracy of the stages precontemplation, contemplation, and preparation amongst smokers. The results strongly supported the stages of change model. Smokers were assessed for their stage of change and then were followed-up at one and six months. At both follow-ups, significantly more people who were previously assessed as being in the preparation stage had made quit attempts than in other stages and significantly more contemplators had made quit attempts than precontemplators. A study conducted by Prochaska, Velicer, Fava, Rossi and Tsoh (2001) evaluated a stage-based expert system intervention for smoking cessation. The stage-based expert system

individualised the interventions to the participants' stage of change and, using computers, interacted with them around the processes and principles that are necessary for them to progress. Prochaska et al. found that they were able to achieve a 25% abstinence rate at 24 month follow-up. This was a good result considering that out of their population, more than 40% were not intending to quit. These findings demonstrated the efficacy of the stages of change model in that interventions tailored to individual's stage of change produced abstinence in people that other interventions would normally fail with. The highest abstinence rates were found in people in preparation, contemplation, and precontemplation, respectively. These findings suggest that the success of an intervention depends upon the amount of preparation smokers have undertaken prior to taking action.

The "stages of change" model has been shown to be effective across different fields. A study by Brogan, Prochaska and Prochaska (1999) found that when the model was applied to the change process in psychotherapy it was shown to be a good predictor of who would remain in treatment. A study conducted by Acton, Prochaska, Kaplan, Small and Hall (2001), which examined the association between depression and stages of change for smoking cessation in a psychiatric outpatient sample supported several tenets of the model. The use of behavioural processes increased from precontemplation to maintenance. In addition, the use of experiential processes was high across all stages. However, the therapy often focused on processes such as consciousness raising and self-reevaluation so it is possible that these processes may have spilt over to the context of smoking cessation, thus accounting for these processes occurring in the later stages of change. An interesting finding was the relationship between stage of change and depression. It was found that contemplators had elevated depression scores. The researchers attributed this to possibly being the

dread felt by smokers who are intending to quit in the next six months. In addition to the dread, the researchers suggested that these contemplators may feel dejection over the discrepancy between their goal of abstinence and their current smoking behaviour, and such dejection can lead to depression. This could be a possible reason for the increased depressive symptoms found amongst smokers compared to non smokers.

Pearlman, Wernicke, Thorndike and Haaga (2004) have also supported the “stages of change” model. They found that individuals in later stages of change have more positive outcome expectancies regarding quitting smoking and more negative outcome expectancies regarding continuing smoking. This finding is supported by previous studies (DiClemente et al., 1991; Prochaska et al., 1994). Pearlman et al. suggested that smoking cessation programs should utilise this finding and develop programs that increase awareness about the benefits and costs of smoking.

Further support for the “stages of change” model was found by DiClemente et al. (1991). They found that there were differences in the number of lifetime quit attempts made by people at different stages of change with precontemplators reporting the lowest number of lifetime quit attempts. In addition, DiClemente et al. also found significant differences across stages of change in regards to individual’s self-efficacy beliefs for quitting smoking. Precontemplators were found to report the most temptation to smoke and the lowest level of confidence in their ability to stop smoking. Confidence about one’s ability to quit smoking significantly increased from precontemplation to contemplation.

Conclusion

The purpose of this paper was to review the literature on smoking and mental health, the various smoking cessation interventions, the research regarding smoking and smoking cessation amongst drug treatment populations, and the findings

regarding smoking cessation and the stages of change model. In addition to the many deaths caused from smoking, it also causes the most economic costs in Australian society of all psychoactive drugs (Collins & Lapsley, 2007). Tobacco is also responsible for a large amount of the mortality and illness of Australian youth, due to involuntary smoking (Collins & Lapsley).

There is a large amount of evidence linking smoking and mental health symptoms, particularly anxiety and depressive symptoms (Breslau et al., 1992; Patton et al., 1996). However, smoking has also been found to be associated with more pervasive mental health disorders, such as panic disorder and agoraphobia (Johnson et al., 2000). It has been suggested that there is a causal link between smoking and mental health problems (Carmody, 1989; Gilbert, 1979). The direction of this link, however, is unknown. It could be that those with mental health problems smoke to reduce the negative affect that they experience as a result of their disorder. Conversely, it could be that smoking contributes to the mental health disorder. There is also evidence to suggest that genetic factors contribute to both (Kendler et al., 1993). Research also suggests that mental health disorders may be associated with the maintenance of smoking because of the more severe nicotine withdrawal symptoms experienced by individuals with mental health disorders (Breslau et al., 1992; Covey et al., 1990)

The many negative consequences resulting from smoking have prompted many smoking cessation interventions to be developed. NRT have been found to be one of the most effective of these strategies (Silagy et al., 1994). However, they have also been associated with a high rate of relapse (Silagy et al.). NRT used in combinations and for extended periods of time have been found to be the most effective (Croghan et al., 2003; Fagerstrom et al., 1993; Steinberg et al., 2006). The

findings on the effectiveness of brief advice delivered by physicians are mixed. However, a constant finding is that the way the advice is delivered is an important determinant of how well the advice will be received (Butler et al., 1998; Stott & Pill, 1990). Other smoking interventions that have been found to be effective are the banning of smoking in certain areas, and proactive counselling as an adjunct to minimal interventions for younger light smoking male individuals (Fitchenburg & Glantz, 2002; Pan, 2006). An individual's level of nicotine dependence, as well as their socioeconomic status, has also been found to be related to how successful an individual will be at quitting smoking (Foulds et al., 2006).

Although rates of smoking have declined in developed countries, there has been no decline in smoking amongst people with substance use disorders (Kalman, 1998). Treating smoking in this population is important because the evidence suggests that the majority of these people will die from smoking-related illnesses and not from alcohol or other drugs (Hser et al., 1994; Hurt et al., 1996). Although it is commonly believed that attempting to address smoking with these individuals could jeopardise effective drug treatment, the majority of evidence suggests otherwise (Bobo et al., 1998; Martin et al., 1997; Burling et al., 1991). In fact, there is evidence to suggest that treating these individual's smoking may actually improve outcomes with other drugs (Bobo et al.).

The stages of change model theorises that a smoker is in one of the five stages of change at any one time (Prochaska & Velicer, 1997). In addition, as an individual moves through the five stages of change, they use a number of different processes of change to help them progress through the stages. There exists a large body of research supporting the stages of change model for smoking and other behaviours (Acton et al., 2001; Brogan et al., 1999; Diclemente et al., 1991; Pearlman et al., 2004; Prochaska et

al., 2001). Characteristics of individuals in the different stages have been reported by research as well as the different processes that are used by individuals in the different stages.

To date, there appears to be a paucity of research regarding stages of change and smoking amongst people attending alcohol and other drug treatment. It may be that the better alcohol and other drug abstinence rates found in those who ceased smoking could be related to the processes that these individuals use whilst ceasing smoking and maintaining smoking cessation. These processes would likely help an individual to stay abstinent from other drugs. It may also be that when these people are entering for alcohol and other drug treatment they are already in the stage of preparation or even maintenance (if they have already been abstinent for a period of time) which may be transferred to their tobacco use as well as their other drug or drugs. With the rates of smoking as high as they are in this population, addressing smoking for these individuals' remains a very important issue in public health and further research in this is necessary.

References

- Acton, G. S., Prochaska, J. J., Kaplan, A. S., Small, T. & Hall, S. M. (2001). Depression and stages of change for smoking in psychiatric outpatients. *Addictive Behaviors, 26*, 621.
- Batel, P., Pessione, F., Maitre, C. & Rueff, B. (1995). Relationship between alcohol and tobacco dependencies among alcoholics who smoke. *Addiction, 9*, 977.
- Bergen, A. W. & Caporaso, N. (1999). Cigarette smoking. *Journal of the National Cancer Institute, 91*, 1365.
- Bobo, J. K., McIlvain, H. E., Lando, H. A., Walker, R. D. & Leed-Kelly, A. (1998). Effect of smoking cessation counseling on recovery from alcoholism: findings from a randomized community intervention trial. *Addiction, 93*, 877.
- Breslau, N., Kilbey, M. M. & Andreski, P. (1992). Nicotine withdrawal symptoms and psychiatric disorders: Findings from an epidemiologic study of young adults. *The American Journal of Psychiatry, 149*, 464.
- Breslau, N., Peterson, E., Shultz, L., Andreski, P. & Chilcoat, H. (1996). Are smokers with alcohol disorders less likely to quit? *American Journal of Public Health, 86*, 985.
- Brigham, G. S., Schroeder, G. & Schindler, E. (2007). Addressing smoking in community drug abuse treatment programs: Practical and policy considerations. *Journal of Psychoactive Drugs, 39*, 435.
- Brogan, M. M., Prochaska, J. O. & Prochaska, J. M. (1999). Predicting termination and continuation status in psychotherapy using the transtheoretical model. *Psychotherapy, 36*, 105.
- Burling, T. A., Marshall, G. D. & Seidner, A. L. (1991). Smoking cessation for substance abuse inpatients. *Journal of Substance Abuse, 3*, 269.

- Butler, C. C., Pill, R. & Stott, N. C. H. (1998). Qualitative study of patients' perceptions of doctors' advice to quit smoking: implications for opportunistic health promotion. *British Medical Journal*, 316, 1878.
- Campbell, B. K., Wander, N., Stark, M. J. & Holbert, T. (1995). Treating cigarette smoking in drug-abusing clients. *Journal of Substance Abuse Treatment*, 12, 89.
- Carmody, T. P. (1989). Affect regulation, nicotine addiction, and smoking cessation. *Journal of Psychoactive Drugs*, 21, 331.
- Collins, D. J. & Lapsley, H. M. (2007). *The costs of tobacco, alcohol and illicit drug abuse to Australian society in 2004/05*. National Drug Strategy Monograph Series No. 64. Retrieved, August 1, 2008, from <http://www.nationaldrugstrategy.gov.au/publications-monographs>.
- Conner, B. T., Stein, J. A., Longshore, D. & Stacey, A. W. (1999). Associations between drug abuse treatment and cigarette use: Evidence of substance replacement. *Experimental and Clinical Psychopharmacology*, 7, 64.
- Covey, L. S., Glassman, A. H. & Stetner, F. (1990). Depression and depressive symptoms in smoking cessation. *Comparative Psychiatry*, 31, 350.
- Croghan, G. A., Sloan, J. A., Croghan, I. T., Novotny, P., Hurt, R. D., DeKrey, W. L., Mailliard, J. A., Ebbert, L. P., Swan, D. K., Walsh, D. J., Wiesenfeld, M., Levitt, R., Stella, P., Johnson, P. A., Tschetter, L. K. & Loprinzi, C. (2003). Comparison of nicotine patch alone versus nicotine nasal spray alone versus a combination for treating smokers: A minimal intervention, randomized, multicenter trial in a nonspecialized setting. *Nicotine and Tobacco Research*, 5, 181.

- DiClemente, C. C., Prochaska, J. O., Fairhurst, S. K., Velicer, W. F., Velasquez, M. M. & Rossi, J. S. (1991). The process of smoking cessation: An analysis of precontemplation, contemplation, and preparation stages of change. *Journal of Consulting and Clinical Psychology*, 59, 295.
- Dudas, R. B., Hans, K. & Barabas, K. (2005). Anxiety, depression and smoking in schoolchildren – implication for smoking prevention. *The Journal of the Royal Society for the Promotion of Health*, 125, 87.
- Epping-Jordan, M. P., Watkins, S. S., Koob, G. F. & Markou, A. (1998). Dramatic decreases in brain reward function during nicotine withdrawal. *Nature*, 76, 393.
- Fagerstrom, K. O., Schneider, N. G. & Lunell, E. (1993). Effectiveness of nicotine patch and nicotine gum as individual versus combined treatments for tobacco withdrawal symptoms. *Psychopharmacology*, 111, 271.
- Fauzia, A. B. (2005). *A comparison of addiction and efficacy oriented messages for smoking cessation*. Ontario, Canada: University of Waterloo.
- Fichtenberg, C. M. & Glantz, S. A. (2002). Effect of smoke-free workplaces on smoking behaviour: Systematic review. *British Medical Journal*, 325, 188.
- Foulds, J., Gandhi, K. K., Steinberg, M. B., Richardson, D. L., Williams, J. M., Burke, M. V. & Rhoads, G. G. (2006). Factors associated with quitting smoking at a tobacco dependence treatment clinic. *American Journal of Health Behavior*, 30, 400.
- Gilbert, D. G. (1979). Paradoxical tranquilizing and emotion-reducing effects of nicotine. *Psychological Bulletin*, 86, 643.
- Glassman, A. H. (1993). Cigarette smoking: Implications for psychiatric illness. *The American Journal of Psychiatry*, 150, 546.

- Glassman, A. H., Stetner, F., Walsh Raizman, P. S., Fleiss, J. L., Cooper, T. B. & Covey, L. S. (1988). Heavy smokers, smoking cessation, and clonidine: Results of a double-blind, randomized trial. *Journal of the American Medical Association*, 259, 2863.
- Gold, P. B., Rubey, R. N. & Harvey, R. T. (2002). Naturalistic, self-assignment comparative trial of bupropion SR, a nicotine patch, or both for smoking cessation treatment in primary care. *American Journal of Addiction*, 11, 315.
- Goodman, E. & Capitman, J. (2000). Depressive symptoms and cigarette smoking among teens. *Pediatrics*, 106, 748.
- Hajek, P., Taylor, T. Z. & Mills, P. (2002). Brief intervention during hospital admission to help patients to give up smoking after myocardial infarction and bypass surgery: randomised controlled trial. *British Medical Journal*, 324, 87.
- Harris, K. J., Okuyemi, M. S., Catley, D., Mayo, M. S., Ge, B. & Ahluwalia, J. S. (2004). Predictors of smoking cessation among African-Americans enrolled in a randomized controlled trial of bupropion. *Preventive Medicine*, 38, 498.
- Heatherton, T. F., Kozlowski, L. T., Frecker, R. C. & Fagerstrom, K. O. (1991). The Fagerstrom Test for Nicotine Dependence: a revision of the Fagerstrom Tolerance Questionnaire. *British Journal of Addictions*, 86, 1119.
- Hser, Y. I., McCarthy, W. J. & Anglin, M. D. (1994). Tobacco use as a distal predictor of mortality among long-term narcotics addicts. *Preventive Medicine*, 23, 61.
- Hughes, J. R., Hatsukami, D. K., Mitchell, J. E. & Dahlgren, L. A. (1986). Prevalence of smoking among psychiatric outpatients. *American Journal of Psychiatry*, 143, 993.

- Hurt, R. D., Offord, K. P., Croghan, I. T., Gomez-Dahl, L., Kottke, T. E., Morse, R. M. Melton, L. J. (1996). Mortality following inpatient addictions treatment – Role of tobacco use in a community-based cohort. *Journal of the American Medical Association*, 275, 1097.
- Johnson, J. G., Cohen, P., Pine, D. S., Klein, D. F., Kasen, S. & Brook, J. S. (2000). Association between cigarette smoking and anxiety disorders during adolescence and early adulthood. *Journal of the American Medical Association*, 284, 2348.
- Jorenby, D. E. (2001). Smoking cessation strategies for the 21st century. *American Heart Association*, 104, e51.
- Judge, K., Bauld, L., Chesterman, J. & Ferguson, J. (2005). The English smoking treatment services: Short-term outcomes. *Addiction*, 100, 46.
- Kalman, D. (1998). Smoking cessation treatment for substance misusers in early recovery: A review of the literature and recommendations for practice. *Substance Use and Misuse*, 33, 2021.
- Kendler, K. S., Neale, M. C., MacLean, C. J., Heath, A. C., Eaves, L. & Kessler, R. (1993). Smoking and major depression: A causal analysis. *Archives of General Psychiatry*, 50, 36.
- Kinnunen, T., Haukkala, A., Quiles, Z. N., Spiro, A. & Garvey, A. J. (2006). Depression and smoking across 25 years of the normative aging study. *International Journal of Psychiatry in Medicine*, 36, 413.
- Martin, J. E., Calfas, K. J. & Patten, C. A., Polarek, M., Hofstetter, R. C., Noto, J. & Beach, D. (1997). Prospective evaluation of three smoking interventions in 205 recovering alcoholics: One-year results of project SCRAP-Tobacco. *Journal of Consulting and Clinical Psychology*, 65, 190.

- Mullins, R., Livingston, P. & Borland, R. (1999). A strategy for involving general practitioners in smoking control. *Australian and New Zealand Journal of Public Health*, 23, 249.
- Murray, R. L., Coleman, T., Antoniak, M., Stocks, J., Fergus, A., Britton, J. & Lewis, S. A. (2008). The effect of proactively identifying smokers and offering smoking cessation support in primary care populations: a cluster-randomized trial. *Addiction*, 103, 574.
- Parrot, A. C. (1993). Cigarette smoking: effects upon self-related stress and arousal over the day. *Addictive Behavior*, 18, 389.
- Patton, G. C., Hibbert, M., Rosier, M. J., Carlin, J. B., Caust, J., Bowes, G. (1996). Is smoking associated with depression and anxiety in teenagers? *American Journal of Public Health*, 86, 225.
- Pan, W. (2006). Proactive telephone counseling as an adjunct to minimal intervention for smoking cessation: a meta analysis. *Health Education Research: Theory & Practice*, 21, 416.
- Pearlman, M. Y., Wernicke, R., Thorndike, F., Haaga, D. A. F. (2004). Stages of change in smoking cessation: A comparison of expectancies among precontemplators and contemplators. *Journal of Rational – Emotive & Cognitive – Behavior Therapy*, 22, 131.
- Pomerleau, O., Adkins, D. & Pertschuck, M. (1978). Predictors of outcome and recidivism in smoking cessation treatment. *Addictive Behaviors*, 3, 65.
- Prochaska, J. O. & Velicer, W. F. (1997). The Transtheoretical Model of health behaviour change. *American Journal of Health Promotion*, 12, 38.

Prochaska, J. O., Velicer, W. F., Fava, J. L., Rossi, J. S. & Tsoh, J. Y. (2001).

Evaluating a population-based recruitment approach and a stage-based expert system intervention for smoking cessation. *Addictive Behaviors*, 26, 583.

Prochaska, J. O., DiClemente, C. C., Velicer, W. F. & Rossi, J. S. (1993).

Standardized, individualized, interactive, and personalized self-help programs for smoking cessation. *Health Psychology*, 12, 399.

Psychology Foundation of Australia (2006). *DASS*. Retrieved, March 20, 2008, from

<http://www2.psy.unsw.edu.au/groups/dass/>

Ryder, D. (1999). Deciding to change: Enhancing client motivation to change behaviour. *Behaviour Change*, 16, 165.

Ryder, D., Salmon, A. & Walker, N. (2001). *Drug use and drug-related harm, a delicate balance*. Melbourne: IP Communications.

Silagy, C., Mant, D., Fowler, G. & Lodge, M. (1994). Meta-analysis on efficacy of nicotine replacement therapies in smoking cessation. *The Lancet*, 343, 139.

Steinberg, M. B., Foulds, J., Richardson, D. L., Burke, M. V. & Shah, P. (2006). Pharmacotherapy and smoking cessation at a tobacco dependence clinic. *Preventive Medicine*, 42, 114.

Stott, N. C. H. & Pill, R. M. (1990). 'Advise yes, dictate no.' Patients' views on health promotion in the consultation. *Family Practice*, 7, 125.

West, R. & Hajek, P. (1997). What happens to anxiety levels on giving up smoking? *The American Journal of Psychiatry*, 154, 1589.

Williams, J. M. & Ziedonis, D. (2004). Addressing tobacco among individuals with a mental illness or an addiction. *Addictive Behavior*, 29, 1067.

WHO (2007). *Tobacco: global programming note 2006-2007: Protecting future generations from the consequences of tobacco consumption and exposure to*

tobacco smoke. Retrieved, March 5, 2008, from

<http://www.who.int/nmh/donorinfo/tobacco/en/index.html>

The Relationship between Nicotine Dependence and Symptoms of Anxiety,
Depression and Stress in a Therapeutic Community for Alcohol and other Drug
Rehabilitation

Thomas Hopkins

Abstract

Smoking is the largest single risk factor for premature death in developed countries. The research suggests that there are also relationships between smoking and symptoms of anxiety, depression and stress. The rates of smoking are much higher amongst individuals with substance use disorders than that of the general community yet smoking cessation is rarely offered in drug treatment programs. The present study aimed to test the relationship between nicotine dependence and symptoms of anxiety, depression and stress in a Therapeutic Community (TC) for alcohol and other drug rehabilitation. Participants were 30 people who were residents of a TC for alcohol and other drug rehabilitation. A correlational research design was utilised to test the relationships between the variables. A oneway ANOVA was also utilised to determine whether entering the TC for dependence on alcohol alone or alcohol and/or other drugs had an influence on participants symptoms of anxiety, depression and stress. A descriptive design was used to analyse self-report survey data. Three questionnaires were used to gather the data. A significant moderate positive correlation was found between nicotine dependence and stress. No significant main effects were found from the ANOVA. The results from the study support past research that suggests that smoking is associated with stress. Support was also provided for the "stages of change" model. If introduced into the TC, smoking interventions could initially involve education aimed at moving clients through the stages of change before offering smoking cessation.

Author: Thomas Hopkins

Supervisors: Dr Deborah Gardner

Dr Shelley Beatty

Submitted: October, 2008

The Relationship between Nicotine Dependence and Symptoms of Anxiety,
Depression and Stress in a Therapeutic Community for Alcohol and other Drug
Rehabilitation
Introduction

Smoking is the largest single risk factor for premature death in developed countries (WHO, 2007). In addition, the relationship between smoking tobacco and chronic health problems is well established (Bergen & Caporaso, 1999). Various health problems such as cancer of the lungs, oesophagus, cervix, anus, throat and bladder, as well as an increased risk of heart disease and stroke are only some of the problems associated with smoking (Ryder Salmon & Walker, 2001). Less appears to be known about the relationships between smoking and mental health problems. Nonetheless, the rates of smoking have been found to be higher amongst psychiatric patients than in the general community (Hughes, Hatsukami, Mitchell, Dahlgren, 1986). Smoking has also been found to have strong associations with depression (Kinnunen, Haukkala, Quiles, Spiro & Garvey, 2006; Williams & Ziedonis, 2004), anxiety (West & Hajek, 1997) and stress (Parrot, 1993).

Tobacco contains the CNS stimulant nicotine (Ryder et al., 2001). Nicotine increases the levels of the neurotransmitter dopamine in the part of the brain that regulates feelings of pleasure (Epping-Jordan, Watkins, Koob & Markou, 1998). It has been found to contribute to dependence, resulting in physical and neurobiologic withdrawal symptoms on cessation (Epping-Jordan et al., 1998).

Mental Health Effects of Smoking

There appears to be relationships between the amount an individual smokes and anxiety and depression. In a study that looked at relationships between smoking and anxiety and depression in teenagers, it was found that participants who reported

high levels of depression and anxiety were twice as likely to be smokers after controlling for potential confounds (Patton et al., 1996). Moreover, regular smokers were almost twice as likely as occasional smokers to report high levels of anxiety and depressive symptoms. This finding indicates that there may be relationships between level of nicotine dependence and anxiety and depression. Goodman and Capitman (2000) also found that current tobacco use among teenagers was a powerful determinant of developing a high level of depressive symptoms.

In addition to depression and anxiety, smoking has also been found to be associated with more pervasive mental health disorders. Heavy smoking of tobacco during adolescence has been associated with an increased risk of developing agoraphobia, generalised anxiety disorder, and panic disorder during early adulthood (after controlling for age, gender, difficult childhood temperament, alcohol and other drug use, anxiety and depressive disorders during adolescence, parental smoking, educational level, and psychopathology) (Johnson et al., 2000). Moreover, when asked to describe their changes in smoking behaviour and feeling states over the previous two years, adolescents reported an increase in affective distress with the progression from experimental to more regular smoking (Hirschman, Leventhal & Glynn, 1984). The first results from the 2007 National Drug Strategy Household Survey (NDSHS) also found that daily smokers were more likely than other recent smokers or non-smokers to report high or very high levels of psychological distress (AIHW, 2007).

It is a commonly held belief amongst smokers that smoking relieves tension and stress (Ikard, Green & Horn, 1969). However, a closer look at the processes that occur in the smoker suggest otherwise. In a study by Parrot (1993) it was found that although smokers experienced a self-reported decrease in stress after smoking

cigarettes, they experienced higher general levels of stress than non-smokers. It was also found that after smoking cessation, smokers' general levels of stress were reduced. When queried about their moods over the day, smokers have reported patterns of repetitive mood fluctuations, with normal moods during cigarette smoking followed by increasing stress periods between cigarettes (Parrot, 1994a; Parrot, 1994b). In addition, these mood fluctuations are more prominent in more dependent smokers, who also report mood control as the main reason for the maintenance of their smoking (Parrot, 1994b). It has also been found that smokers' stress levels are similar to non smokers only whilst smoking and become worse during periods of abstinence (Parrot & Garnham, 1998). The repeated occurrence of elevated stress levels between cigarettes suggests that smokers experience above average daily stress levels. These findings suggest that smoking may contribute to increased stress levels in smokers.

The research on smoking cessation and stress also suggests smoking contributes to stress levels. In a study that monitored smokers who were attempting to quit unaided over six months, Cohen and Lichtenstein (1990) found that the smokers who failed to quit reported unchanging levels of high stress at every follow-up session. Contrastingly, the former smokers who completely abstained from smoking during the six months reported a steady decrease in stress over time. These findings were made all the more important by the fact that both the successful and unsuccessful quitters reported similar stress levels at baseline, so it was not just the less stressed smokers who successfully quit. Other research has also found reduction in stress levels of former smokers after cessation (Carey, Kalra, Carey, Halperin & Richards, 1993; Parrot, 1995). The apparent high stress levels of smokers may adversely affect their success when they engage in smoking cessation interventions.

Smoking Cessation Interventions

Due to the many negative consequences associated with smoking, such as an increased risk for both physical and mental illness including increased stress, many smoking cessation intervention strategies have been developed throughout the years. Nicotine replacement therapies (NRT) work by replacing the nicotine delivered by cigarettes so as to reduce the negative affect associated with nicotine withdrawal (Gold, Ruby & Harvey, 2002). In a meta-analysis on the efficacy of NRT for smoking cessation conducted by Silagy, Mant, Fowler and Lodge (1994), it was found that NRT were effective in aiding smoking cessation. However, all forms of NRT were associated with a high relapse rate suggesting that minimising relapse is important if long-term smoking cessation is to be maintained. Other studies have shown NRT as well as bupropion hydrochloride (referred to bupropion) as being one of the most effective smoking cessation strategies (Gold et al.; Jorenby, 2001). Bupropion is an anti-depressant that works on the central nervous system to reduce the withdrawal symptoms during smoking cessation (Gold et al.).

There is also evidence to suggest that using combinations of medications for smoking cessation can be effective. Some studies have shown combinations of NRT to be more effective when compared with an NRT on its own (Croghan et al., 2003; Fagerstrom, Schneider & Lunell, 1993). A study by Steinberg, Foulds, Richardson, Burke and Shah (2006) which assessed the efficacy of combinations of medications for smoking cessation found that the use of combinations of medications was associated with a higher probability of remaining abstinent. Although this trend reduced somewhat over time, a six month follow-up indicated that it was continuing. Interestingly, those who received combinations of medications were assessed as being more nicotine dependent at the beginning of the study, but they still did as well as less

dependent smokers at both follow-ups. Steinberg et al. also found that longer duration of medication use was associated with better outcomes. It was found that those who continued to use medications had considerably better abstinence rates at six months.

In recent years, doctors have been encouraged to routinely offer smoking cessation advice to all presenting patients who are smokers (Mullins, Livingston & Borland, 1999; Murray et al., 2008). The findings on the effectiveness of this approach are mixed. Murray et al. found that proactively identifying smokers who wanted to quit in primary care populations and referring them to a cessation service increased contacts with cessation services and the number of quit attempts. However, it was found that at the population level there was no significant impact on actual quit rates or reported cigarette consumption. Hajek, Taylor and Mills (2002) found that a single session brief intervention to prevent cardiac inpatients from returning to smoking after discharge was ineffective. The researchers concluded that single session brief interventions are insufficient to influence highly dependent smokers to quit.

Factors Affecting Intervention Success

Socioeconomic status has been found to be a predictor of success at smoking cessation. Foulds et al. (2006) found that participants with only a high school education were significantly less likely to have remained abstinent at both follow-up periods compared with participants who had a university degree. In addition, being unemployed predicted a poor outcome at four weeks follow-up, and not having private health insurance predicted a poor outcome at 26 week follow-up. The researchers suggested that the effect of socioeconomic background on outcomes is a result of the social environment of those with a lower socioeconomic background. For example, those with a lower socioeconomic background are less likely to work in smoke-free environments and are more likely to have friends and family who smoke.

Socioeconomic status and education level has also been found to be a predictor of smoking. Research has found rates of smoking to be higher amongst people with a lower educational background when compared to people with a higher educational background (Blakey & Wilson, 2005). A study by Kestila et al. (2006) found that young adults in the lowest educational category had a much higher risk of developing daily smoking than those in the highest educational category.

The “stages of change” model was developed from observations of how people quit smoking on their own and has proven to be effective in the development of smoking cessation interventions (Prochaska, DiClemente, Velicer & Rossi, 1993). The five stages can have a bearing on how successful an individual will be at quitting smoking or changing any other kind of behaviour (Prochaska & Velicer, 1997). The stages are precontemplation, contemplation, preparation, action, and maintenance. People in the precontemplation stage are not intending to quit smoking in the near future, usually measured as the next six months. Individuals in the precontemplation stage may be underinformed of the full extent of the consequences of their behaviour or may be demoralised after failed attempts at behaviour change in the past. Precontemplators are resistant and are not ready for any interventions. People in the contemplation stage are intending to quit in the next 6 months. They are more aware of the benefits of changing their behaviour than people in precontemplation but are also very aware of the costs. People in contemplation seem to be in a state of ambivalence and can be in the contemplation stage for a very long time. They are typically not ready for action-oriented interventions. People in the preparation stage are intending to quit in the immediate future; usually measured as in the next 30 days. Generally these people have taken some form of action over the past year such as having sought counselling, consulted their physician, or bought a self-help book, and

also have a plan of future action. People in the action stage have stopped smoking within the last 6 months. When the model is applied to smoking, only complete abstinence qualifies as being action. Simply cutting down on the number of cigarettes or switching to lower tar or nicotine brands does not qualify as being action. This is because there is no safe level of use for tobacco (WHO, 2007). People in the maintenance stage are in the process of preventing relapse but do not have to focus on maintaining their change as much as those in action. It is estimated that people can be in the maintenance stage for anywhere between six months and five years. The “stages of change” model is a commonly used model in the addictions and public health field and is supported by a large body of research (Brogan, Prochaska and Prochaska, 1999; DiClemente et al., 1991; Pearlman, Wernicke, Thorndike and Haaga, 2004; Prochaska et al., 1994; Prochaska, Velicer, Fava, Rossi and Tsoh, 2001).

Smoking Interventions and Alcohol and Other Drug Treatment

Due to many factors, such as the increased awareness of the health consequences associated with smoking as well as interventions such as banning smoking in public places, smoking has declined in developed countries in recent years (WHO, 2007). Despite this, there has been no significant reduction in smoking among individuals with substance use disorders (Kalman, 1998). The rates of smoking among individuals with substance use disorders have been found to be double to triple that of the general community (Batel, Pessione, Maitre & Rueff, 1995). In addition, many of the individuals that are successfully treated for their drug dependencies will experience a reduced quality of life and longevity due to smoking (Hurt et al., 1996). Indeed it is tobacco (not alcohol or illicit drugs) that has been found to be the leading

cause of death among former patients of a community addictions treatment program (Hurt et al.).

Many drug treatment counsellors discourage clients from quitting smoking in early stages of recovery (Brigham, Schroeder & Schindler, 2007). One reason that smoking cessation is not advocated by drug treatment programs is that there is a concern that this could deter some individuals who are willing to address their substance use problem but not their smoking (Bobo, McIlvain, Lando, Walker & Leed-Kelly, 1998). Another reason is the belief that encouraging smoking cessation during drug treatment could jeopardise effective treatment (Campbell, Wander, Stark & Holbert, 1995). Contrary to this commonly held belief, the research suggests that smoking cessation does not risk successful substance use treatment. A study by Martin et al., (1997) in which 205 recovering alcoholics were assigned to one of three smoking cessation groups found that at 12-month follow-up, only four percent of all participants had relapsed to use alcohol or other drugs. However, the lack of a non smoking cessation control group limited the study. Further support for these findings came from a study conducted by Burling, Marshall and Seidner (1991) in which 39 inpatient alcohol dependent men were randomly assigned to a tobacco intervention or waitlist control group. No adverse effect on treatment was found for the tobacco intervention group as compared to the waitlist control group. In addition, Bobo et al. (1998) from their study of a randomised community intervention involving 575 individuals from 12 residential treatment programs had a primary finding that urging alcohol dependant individuals to quit smoking is safe, even in early stages of recovery. No adverse effect was detected on participants being able to remain abstinent after treatment discharge. It was actually found that the likelihood of remaining abstinent for those who were repeatedly encouraged to quit smoking was

almost twice that of the control group over the one year follow-up. The researchers attributed the more favourable outcomes for those exposed to the tobacco intervention to a number of factors. It was likely that some of the aspects from the tobacco counselling reinforced key elements of effective alcohol treatment. In addition, the counselling sessions encouraged personal responsibility and supported a drug-free lifestyle, messages which may have generalised to alcohol use. The study was limited by the fact that all study data, apart from the analysis of saliva samples, were gathered via self-report. However, the researchers suggested that was unlikely to bias their primary finding as they were unable to detect evidence of differential reporting between intervention and control groups. This is an interesting finding and is contrary to what is believed throughout the addictions field.

Smoking in the Therapeutic Community for Alcohol and Other Drug Treatment

Whilst there is a large amount of existing research regarding the association between smoking, stress, anxiety and depression, as well as on the various smoking cessation strategies, to date there appears to have been little research conducted on these issues involving residents of a Therapeutic Community (TC) for alcohol and other drug (AOD) rehabilitation. Research suggests that smoking contributes to high stress levels (Parrot, 1993), anxiety (West & Hajek, 1997), and depressive symptoms (Kinnunen et al., 2006; Williams & Ziedonis, 2004). Therefore, determining whether smoking is contributing to these mental health problems in such a population could aid in the treatment of these individuals by giving reason to incorporate smoking reduction education and possibly smoking cessation strategies appropriate to individuals' progress in the rehabilitation program. Knowledge that smoking cessation may reduce such unpleasant symptoms could also provide motivation for residents living in the TC to stop or reduce their smoking. In addition, determining residents'

stages of change (Prochaska & Velicer, 1997) and past or current experience with smoking cessation may also contribute to the development of effective smoking cessation strategies. In the proposed study, the relationships between nicotine dependence and symptoms of anxiety, depression and stress will be examined. Therefore, the research question that will be tested is: Do symptoms of anxiety, depression and stress increase as nicotine dependence increases? It is hypothesised that as the level of nicotine dependence increases, symptoms of anxiety, depression and stress will also increase. If nicotine contributes to affective distress, as the research suggests, then it may be that the more drugs individuals use the more affective distress they experience. Therefore, the second research question to be tested is: does having entered the TC for dependence on alcohol alone or alcohol and/or other drugs have an influence on participants' symptoms of anxiety, depression and stress? It is hypothesised that those who have entered the TC for dependence on alcohol and/or other drugs will score higher on measures of anxiety, depression and stress than those who have entered the TC for dependence on alcohol alone. In addition, participants' stages of change regarding smoking will be determined, as well as their views, motivations, and past experiences regarding smoking cessation. This information will assist Cyrenian House to make decisions about smoking cessation interventions appropriate for its clients.

Method

Design

The present study utilised a correlational research design to test the relationship between nicotine dependence and symptoms of anxiety, depression and stress. In addition, Crosstabs were also used to describe the relationships between the non continuous variables and the continuous and non continuous variables.

Questionnaires were used to measure the variables. A descriptive design was used to analyse exploratory self-report survey data.

Materials

Three questionnaires were completed by the participants. The first questionnaire consisted of demographic questions and some questions regarding views, motivations, and past smoking cessation experiences (see Appendix A). The second questionnaire was the Fagerstrom Test for Nicotine Dependence (FTND) (Heatherton, Kozlowski & Frecker, 1991) (see Appendix B) and the third questionnaire was the Depression, Anxiety and Stress Scale (DASS) (Psychology Foundation of Australia, 2006) (see Appendix C). An information sheet (see Appendix D) was presented to the participants prior to administering the questionnaires.

Fagerstrom Test for Nicotine Dependence

The FTND is a self-report scale consisting of six questions with at least two possible answers for each question. Each answer has a corresponding score. The total score is calculated at the end which then gives an indication of an individual's level of nicotine dependence. There are five levels of nicotine dependence that an individual can fall into: very low dependence, low dependence, medium dependence, high dependence, and very high dependence. The FTND has been validated for adult populations and has acceptable construct validity, test-retest reliability, and internal consistency (Fauzia, 2005).

Depression Anxiety and Stress Scale

The DASS consists of a set of three self-report scales designed to measure the emotional states of depression, anxiety and stress. It is a 42-item scale in total, with a 4-point likert response format measuring the severity/frequency to which an

individual has experienced certain states over the past week. Each of the three scales contains 14 items which are divided into subscales of 2-5 items with similar content. The scales of the DASS have been found to have high internal consistency and to yield meaningful discriminations in a variety of settings (Psychology Foundation of Australia, 2006).

Participants

The participants were 30 adults aged 18 years or older, who were living in a TC for alcohol and other drug rehabilitation.

Procedure

The proposed research was conducted with the assistance and approval of Cyrenian House Therapeutic Community (see Appendix E). In addition, the research had Edith Cowan University ethics clearance. Residents were given the information sheet outlining the nature and purpose of the research (see Appendix D), and were then given a package containing the three questionnaires which took approximately 30 minutes to complete. A box was provided for residents to place completed questionnaires into over the next week and they were informed of the researcher's availability to answer any questions or help with any problems they might encounter. Residents were informed that participation was not compulsory and that they would be able to withdraw from the study at any time without prejudice. In addition, all participants remained anonymous.

Correlation Analysis

The questionnaire data was entered into SPSS for Windows (Version 12.0), (Coakes, 2005) and a Pearson product-moment correlation coefficient (Pearson's r) was conducted between the level of nicotine dependence and levels of anxiety, depression and stress. This allowed for any relationship among the variables to be

identified. In addition, Cross tabulations using Spearman Rho were performed between the non continuous variables, and the continuous and non continuous variables.

Results

The intercorrelations of all the variables are shown in Table I along with the means and standard deviations of the continuous variables. There were no significant correlations found between nicotine dependence and anxiety and depression. A moderate significant positive correlation was found between nicotine dependence and stress. There was a significant moderate positive correlation found between participants' stage of change and whether they want to smoke. There was also a significant moderate-to-strong positive correlation found between participants' stage of change and how much entering the TC motivated them to quit smoking. In addition, there was a significant strong negative correlation found between participants' stage of change and whether they would use quit support if it was offered to them during their stay in the TC. A significant moderate positive correlation was also found between participants' age of first cigarette used and participants' age of first smoking daily. Moreover, significant moderate positive correlations were found between education and participants' age of first cigarette and participants' age of first smoking daily. Additionally, there was also a significant weak positive correlation found between education and having ever smoked.

Group Comparison Analysis

A oneway analysis of variance (ANOVA) was conducted using SPSS for Windows (Version 12.0) to determine the influence of whether participants drug of choice influenced their anxiety, depression and stress scores. The main effect for depression was not significant, $F(1, 29) = 0.01, p > .05$. The main effect for anxiety

was not significant, $F(1, 29) = 0.46, p > .05$. The main effect for stress was also not significant, $F(1, 29) = 0.59, p > .05$.

Table I. Intercorrelations for the variables

	D	A	S	ND	Age	Gen	Edu	LS	AFC	ASD	CS	CCD	WTS	SOC	SDS	Mot	OSA	QS	CuS	ES	DOC
D	†1.00																				
A	†0.69**	†1.00																			
S	†0.64**	†0.84**	†1.00																		
ND	†0.10	†0.30	†0.45*	†1.00																	
Age	-0.26	-0.45*	0.12	0.16	1.00																
Gen	0.08	0.25	0.18	-0.02	-0.27	1.00															
Edu	-0.25	-0.31	-0.25	-0.06	0.40*	-0.22	1.00														
LS	-0.35	-0.40*	-0.31	-0.23	-0.06	0.05	-0.23	1.00													
AFC	-0.17	-0.07	-0.14	0.23	0.13	0.11	0.48**	-0.18	1.00												
ASD	-0.20	-0.39	-0.40*	-0.32	0.08	0.00	0.49**	0.10	0.59**	1.00											
CS	-0.18	-0.21	-0.10	-0.09	-0.09	-0.08	0.05	0.09	-0.14	0.05	1.00										
CCD	-0.24	-0.30	-0.27	-0.21	0.02	-0.18	0.10	0.03	-0.09	0.28	0.35	1.00									
WTS	-0.04	-0.13	-0.28	-0.02	0.10	0.15	0.02	-0.09	0.13	0.10	0.08	-0.29	1.00								
SOC	0.08	-0.15	-0.15	-0.12	0.11	-0.08	-0.11	-0.09	-0.17	0.07	-0.23	-0.04	0.42*	1.00							
SDS	-0.39*	-0.20	-0.32	-0.41*	0.04	0.06	0.23	0.19	0.20	0.44*	-0.19	0.06	-0.06	0.01	1.00						
Mot	-0.05	-0.18	-0.22	-0.02	0.31	0.04	0.26	0.05	0.07	0.08	-0.21	-0.21	0.45*	0.62**	-0.07	1.00					
OSA	0.12	-0.03	0.03	0.02	0.05	0.28	-0.01	0.10	0.20	0.10	0.09	-0.27	0.13	-0.14	0.10	-0.23	1.00				
QS	0.03	0.02	0.15	0.14	0.18	-0.05	0.12	0.15	0.03	-0.09	0.08	-0.03	-0.35	-0.71**	-0.02	-0.52**	0.49**	1.00			
CuS	0.03	-0.41*	-0.36	-0.51**	0.06	0.00	0.21	-0.09	-0.24	0.08	-0.09	-0.17	0.28	0.37	-0.08	0.31	0.21	-	1.00		
ES	-0.15	-0.31	-0.30	-0.41*	0.12	-0.09	0.37*	-0.32	-	-	-	-	-	-	-	-	-	-	0.80**	1.00	
DOC	-0.07	0.14	0.11	-0.06	-0.21	0.38*	-0.35	0.22	-0.31	-0.18	-0.01	0.11	-0.07	-0.08	0.12	-0.08	0.03	-0.05	-0.16	-0.31	1.00
Mean	13.43	12.33	17.63	5.63																	
SD	10.53	9.35	10.57	2.83																	
N	30	30	30	30																	

† Pearson *r* measure of correlation; ** = $p < 0.01$; * = $p < 0.05$ (Pearson *r* and Spearman rho); D, Depression; A, Anxiety; S, Stress; ND, Nicotine Dependence; Gen, Gender; Edu, Education; LS, Length of Stay; AFC, Age of First Cigarette; ASD, Age of Starting Smoking Daily; CS, Couldn't Stop Smoking; CCD, Couldn't Cut Down Smoking; WTS, Want to Smoke; SOC, Stage of Change; SDS, Smoking Decreases Stress; Mot, Entering the TC Motivation to Quit Smoking; OSA, One Smoke Area; QS, Quit Support; ES, Ever Smoker; CuS, Current Smoker; DOC, Drug of Choice

Discussion

The present study aimed to test the research question: Do symptoms of anxiety, depression and stress increase as nicotine dependence increases? It was hypothesised that as the level of nicotine dependence increases, symptoms of anxiety, depression and stress will also increase. The findings of the present study only partially support the hypothesis. There was a moderate significant positive relationship found between nicotine dependence and stress. This finding is consistent with previous research that has shown that smoking actually exacerbates stress and that more dependent smokers are more stressed (Parrot & Garnham, 1998; Parrot, 1993; Parrot, 1994a; Parrot, 1994b). Previous research has found that, contrary to commonly held beliefs in the addictions field, smoking cessation amongst people in alcohol and other drug treatment does not jeopardise their treatment and has actually shown to improve treatment outcomes (Bobo et al., 1998; Martin et al., 1997; Burling et al., 1991). The present study showed that the more nicotine dependent individuals were in the TC, the more likely they were to have higher stress levels. Previous research has shown that ceasing smoking actually results in a decrease in stress levels for the abstaining smoker (Carey et al., 1993; Cohen and Lichtenstein, 1990; Parrot, 1995). Therefore, if the residents were ceasing smoking during their stay in the TC they may have lower stress levels and consequently may be better equipped to achieve successful treatment outcomes.

Previous research has found that the more dependent an individual is on nicotine, the more they will report they rely on smoking for stress release (Parrot, 1994b). The present study supports this research. There was a significant moderate negative relationship found between nicotine dependence and whether an individual thinks that

smoking decreases their stress levels. This indicated that the more dependent participants were on smoking, the more likely they were to answer 'yes' to the whether they think smoking decreases their stress levels. All the participants apart from one who scored five or more on the nicotine dependence scale said they thought smoking decreases their stress levels. In contrast, out of the five people who scored less than five on the nicotine dependence scale, only two answered 'yes' and three answered 'no'. In addition to this, there was a significant moderate relationship found between participants' age of first smoking daily and whether they think smoking decreases their stress levels. This indicates that the younger participants were when they started smoking daily, the more likely they are to rely on smoking for stress release, suggesting that they are generally more stressed.

Although there was a relationship found between nicotine dependence and stress, there were no significant relationships found between nicotine dependence and depression and anxiety. It is unclear why there was no relationship between nicotine dependence and anxiety or depression. One possible explanation is that much of the education that is delivered in the TC is based on cognitive-behavioural therapy (CBT), which teaches techniques around reducing these symptoms. The lower scores for anxiety and depression in comparison to stress could be attributable to the residents using CBT effectively. In addition to this, it could also be that the participants in the TC were in a positive frame of mind because their lives are heading in a better direction by being a part of the TC, therefore reporting lower depressive and anxiety symptoms.

The non significant results from the ANOVA indicate that there was not a significant difference between the anxiety, depression and stress scores of people who

had entered the TC dependent on alcohol and people who were dependent on alcohol and/or other drugs. Nonetheless, the present study demonstrated that the residents of the TC in general, experience higher levels of affective distress than that of the general population. The means from a sample of 2914 adults from the general population on measures of depression, anxiety, and stress were 6.34, 4.70, and 10.11 respectively (Lovibond & Lovibond, 1995). The means for depression, anxiety and stress from the present study were 13.43, 12.33, and 17.63 respectively. The mean for depression fell into the mild category, the mean for anxiety fell into the moderate category and the mean for stress fell into the mild category. Stress scores were the highest out of the three scores. This is consistent with the measure with the cut-offs for the different categories being the highest for stress followed by depression and then anxiety.

Previous research has found rates of smoking among individuals with substance use disorders to be double to triple that of the general community (Batel, Pessione, Maitre & Rueff, 1995). The first results of the NDSHS revealed that in 2007, 16.6% of the population aged 14 years or older reported smoking daily (AIHW, 2007). The present study found that 90% of participants were smoking daily. Although the participants in the present study were aged 18 years or older and the population included in the NDSHS were aged 14 years or older, this finding is still important and supports past research that has suggested that the rates of smoking are much higher amongst individuals with substance use disorders than that of the general community.

Support for the “stages of change” theory came from the present study. There was a significant moderate positive relationship found between participants’ stage of change and whether they want to smoke presently. This indicates that the participants in the

earlier stages of change were more likely to want to smoke and the participants in the later stages of change were less likely to want to smoke, supporting the concept that when people are in precontemplation they can be regarded as 'happy users' (Prochaska & Velicer, 1997). In addition, there was a significant strong positive relationship between participants' stage of change and how much entering the TC motivated them to quit smoking. This indicates that for the individuals in the early stages of change, entering the TC was less likely to motivate them to quit smoking, and for the individuals in the later stages of change, entering the TC was more likely to motivate them to quit smoking. Furthermore, there was a significant strong negative relationship found between participants' stage of change and whether they would use quit support if it was offered to them during their stay in the TC. This indicates that the participants in the later stages of change were much more likely to utilise quit support if offered to them during their stay in the TC. These findings support the idea that people in the later stages of change are more consciously thinking about quitting smoking and are consistent with previous research regarding the stages of change theory (Brogan, Prochaska and Prochaska, 1999; DiClemente et al., 1991; Pearlman, Wernicke, Thorndike and Haaga, 2004; Prochaska et al., 1994; Prochaska, Velicer, Fava, Rossi and Tsoh, 2001).

Although weak, a significant negative relationship was found between participants' stage of change and nicotine dependence. This indicated that participants in the later stages of change tended to have lower scores on the nicotine dependence scale suggesting that it may be easier for these individuals to be thinking about or planning on quitting if their nicotine dependence is not so high. The relationship may also be a result

of these individuals smoking less in preparation for quitting smoking and therefore having a lower level of nicotine dependence.

There was a significant moderate positive relationship found between age of first cigarette and age of starting smoking daily. This finding indicates that the older participants were when they tried their first cigarette, the older they were when they started smoking daily. For example, a large proportion of the participants that tried their first cigarette between ages 10-14, started smoking daily between ages 14-18. There was also a weak significant negative relationship found between age of starting smoking daily and stress, as well as a weak significant negative relationship found between age of starting smoking daily and anxiety. This indicates that as age of starting smoking daily increases, stress and anxiety decreases. Therefore, the younger participants were when they had taken up smoking regularly, the more likely they were to have high stress and anxiety levels presently. This is in line with previous research that suggests that taking up regular smoking at a young age can have worse mental health outcomes than taking up regular smoking at an older age (Hirschman et al., 1984; Johnson et al., 2000). Further supporting these findings was the significant moderate positive relationship found between participants' age of starting smoking daily and whether they think that smoking decreases their stress levels. This relationship indicates that the older participants were when they started smoking daily the more likely they were to report that they do not think that smoking decreases their stress levels. These findings highlight the importance of preventing youth from experimenting with smoking.

Research has found socioeconomic status and education level to be a predictor of smoking, as well as a predictor of success at smoking cessation (Blakey & Wilson, 2005;

Foulds et al., 2006; Kestila et al., 2006). The findings from the present study support previous research. Significant moderate positive relationships were found between education and participants' age of first cigarette use and age of first smoking daily, indicating that the higher the level of education obtained by participants, the older they were more likely to be when they tried their first cigarette and when they started smoking daily. In addition, there was also a significant weak positive correlation found between education and participants having ever smoked, indicating that the higher the level of education obtained by participants, the less likely they were to have ever smoked. This could also be seen from screening the data: both never smokers being two of only five participants who had university degrees. Interestingly, in addition to this, one of the other three participants that had a university degree only had a score of one on the nicotine dependence scale. Previous research has suggested that the effect of socioeconomic background on smoking is a result of the social environment of those with a lower socioeconomic background (Foulds et al., 2006). For example, those with a lower socioeconomic background are less likely to work in smoke-free environments and are more likely to have friends and family who smoke. This is likely the case for the present study.

Previous research has shown NRT to be an effective strategy to assist people to quit smoking (Gold et al., 2002; Jorenby, 2001; Silagy et al., 1994). The findings from the present study further support past research. It was found that of the 13 people that had used NRT in the past, nine of those found NRT to be effective in helping to quit smoking. However, all of these individuals were currently smoking so therefore the NRT did not have a lasting effect which is also consistent with previous research (Silagy et al.). The

next most common strategy that people had used in the past was asking their doctor for help to quit. However, of the seven people who did this only three said that it had been effective. This is also in line with previous research that has found brief interventions delivered by doctors to be ineffective in helping people to quit (Hajek et al., 2002; Murray et al., 2008).

Participants were also asked what had motivated them to quit smoking in the past. The most common answers were 'it was costing too much money', 'I wanted to get fit', 'it was affecting my fitness', as well as 'I was pregnant or wanting to start a family'. These answers were markedly more frequent than the health warnings or quit advertisements on TV answers. This information could be useful in the development of strategies to motivate people to quit smoking.

When asked why they don't intend to quit the most frequent answer given by participants was 'I am addicted to nicotine' followed closely by 'I enjoy smoking' and 'smoking relaxes me'. This is consistent with previous research that has found that smokers indicate that smoking relaxes them and that they enjoy smoking (Ikard et al., 1969). This further supports the concept that smoking contributes to stress levels in the smoker, in that their general stress levels are higher and smoking brings their stress levels back to the same as a non smoker's general stress levels (Parrot, 1993; Parrot, 1994a; Parrot, 1994b). However, smoking is more likely to contribute to high stress levels than it is to relieving stress. Smokers probably perceive smoking to relieve their stress because they get relief almost immediately when they light a cigarette. But this relief is more likely to be related to nicotine levels in the blood being increased as soon as a cigarette is lit (i.e. with the first puff). So what smokers perceive as stress relief is actually relief

from the feeling they get when they have gone without a cigarette for a period of time. This is a result of the physical dependence that occurs from nicotine use.

Findings of importance for Cyrenian House include the finding regarding participants' views towards quit support. Of the participants that responded to the question, 48.1% indicated that they would use quit support if it were offered to them during their stay in the TC. This finding goes against the commonly held belief that people seeking AOD treatment are only interested in dealing with their AOD dependencies and do not want to address their smoking. The relationship found between participants' stage of change and whether they would use quit support also suggests that a large proportion of the other 51.9% who indicated that they would not use quit support are likely part of the 57.1% of participants that were in precontemplation. Therefore, these individuals could be given education to move them into preparation and then could be offered quit support by way of NRT. In addition, there was a significant moderate positive relationship found between whether participants want to smoke and how much entering the TC motivated them to quit smoking, indicating that the participants that reported not wanting to smoke were more likely to report that entering the TC motivated them to quit smoking. There was also a significant moderate negative relationship found between how much entering the TC motivated participants to quit smoking and whether they would use quit support if offered to them. This indicates that the participants who reported being motivated to quit smoking would be more likely to use quit support if it was offered to them. Moreover, a significant moderate positive relationship was also found between whether participants would use quit support if offered to them and the effect that having one smoking area in the TC would have on their smoking. This

indicates that those who reported that they would not use quit support were more likely to report that having one smoking area in the TC would reduce their smoking largely.

Other noteworthy findings include the significant negative moderate relationship found between age and anxiety, indicating that the younger the participants were the more likely they were to have higher anxiety scores. Moreover, there was a significant negative moderate relationship also found between length of stay and anxiety, indicating that the less time participants had been residents of the TC the more likely they were to have higher anxiety scores. This finding stands to reason, in that people would be more anxious in their first few weeks of entering a rehabilitation program, whether from experiencing withdrawal symptoms or from adjusting to a foreign environment.

There are some limitations with the present study. Firstly, all data was gathered via self-report so it could not be certain that participants answered all questions honestly. Secondly, participants in a residential drug rehabilitation setting are likely to experience negative affect due to withdrawal from alcohol and other drugs. This may have influenced the participants' scores on the DASS instrument. Finally, a sample size of more than 30 participants would have been desirable. However, there are normally only 25 to 30 residents staying in the TC at any one time and due to the unique nature of the setting it was not feasible to recruit participants from other residential rehabilitation centres. The fact that all participants were from Cyrenian House TC was also a strength of the present study. The findings may inform Cyrenian House as to the most appropriate action to undertake regarding smoking cessation and intervention. Another strength of the study was the measure of the effect of nicotine on mental health. Most other studies on the effect of nicotine on mental health symptoms have not been conducted on individuals

living in a TC for alcohol and other drug rehabilitation. Residents of the TC are not permitted to use alcohol or other drugs that are not prescribed during their stay. In contrast, other studies would likely not have been able to control for their participants using alcohol or other drugs and therefore may have had results that were influenced by their participants using alcohol or other drugs. Therefore, in this sense, the present study is a more pure measure of the effect of nicotine on mental health.

In conclusion, the findings from the present study suggest that smoking may be contributing to the TC residents' stress levels. Therefore, if smoking intervention can reduce symptoms of stress for residents it may result in better treatment outcomes. For those residents assessed as being in the early stages of change, interventions could focus on moving residents through the stages of change before incorporating smoking cessation. Interventions could include education around the negative health consequences of smoking as well as education around the less commonly known mental health problems associated with smoking. In addition, the education could also incorporate some stress management techniques. Residents assessed as being ready to change their smoking behaviour, along with residents who have received intervention, could be offered smoking cessation, with the aid of NRT. This may result in lower symptoms of stress due to the fact they would be receiving a consistent amount of nicotine throughout the day instead of intermittent periods of heavy smoking. To incorporate smoking intervention and cessation into the TC program and assess residents' symptoms of anxiety, depression and stress pre and post intervention and cessation would be a useful direction for future research.

References

- Australian Institute of Health and Welfare (2008). *The 2007 National Drug Strategy Household Survey: first results*. Drug Statistics Series number 20. Cat. no. PHE 98. Canberra: AIHW.
- Batel, P., Pessione, F., Maitre, C. & Rueff, B. (1995). Relationship between alcohol and tobacco dependencies among alcoholics who smoke. *Addiction*, 9, 977.
- Bergen, A. W. & Caporaso, N. (1999). Cigarette smoking. *Journal of the National Cancer Institute*, 91, 1365.
- Blakely, T. & Wilson, N. (2005). The contribution of smoking to inequalities in mortality by education varies over time and by sex: Two national cohort studies, 1981-84 and 1996-99. *International Journal of Epidemiology*, 34, 1054.
- Bobo, J. K., McIlvain, H. E., Lando, H. A., Walker, R. D. & Leed-Kelly, A. (1998). Effect of smoking cessation counseling on recovery from alcoholism: findings from a randomized community intervention trial. *Addiction*, 93, 877
- Brigham, G. S., Schroeder, G. & Schindler, E. (2007). Addressing smoking in community drug abuse treatment programs: Practical and policy considerations. *Journal of Psychoactive Drugs*, 39, 435.
- Brogan, M. M., Prochaska, J. O. & Prochaska, J. M. (1999). Predicting termination and continuation status in psychotherapy using the transtheoretical model. *Psychotherapy*, 36, 105
- Burling, T. A., Marshall, G. D. & Seidner, A. L. (1991). Smoking cessation for substance abuse inpatients. *Journal of Substance Abuse*, 3, 269.

- Campbell, B. K., Wander, N., Stark, M. J. & Holbert, T. (1995). Treating cigarette smoking in drug-abusing clients. *Journal of Substance Abuse Treatment*, 12, 89.
- Carey, M. P., Kalra, D. L., Carey, K. B., Halperin, S. & Richards, C. S. (1993). Stress and unaided smoking cessation: A prospective investigation. *Journal of Consulting and Clinical Psychology*, 61, 831.
- Cohen, S. & Lichtenstein, E. (1990). Perceived stress, quitting smoking, and smoking relapse. *Health Psychology*, 9, 466.
- Croghan, G. A., Sloan, J. A., Croghan, I. T., Novotny, P., Hurt, R. D., DeKrey, W. L., Mailliard, J. A., Ebbert, L. P., Swan, D. K., Walsh, D. J., Wiesenfeld, M., Levitt, R., Stella, P., Johnson, P. A., Tschetter, L. K. & Loprinzi, C. (2003). Comparison of nicotine patch alone versus nicotine nasal spray alone versus a combination for treating smokers: A minimal intervention, randomized, multicenter trial in a nonspecialized setting. *Nicotine and Tobacco Research*, 5, 181.
- DiClemente, C. C., Prochaska, J. O., Fairhurst, S. K., Velicer, W. F., Velasquez, M. M. & Rossi, J. S. (1991). The process of smoking cessation: An analysis of precontemplation, contemplation, and preparation stages of change. *Journal of Consulting and Clinical Psychology*, 59, 295.
- Epping-Jordan, M. P., Watkins, S. S., Koob, G. F. & Markou, A. (1998). Dramatic decreases in brain reward function during nicotine withdrawal. *Nature*, 76, 393.
- Fagerstrom, K. O., Schneider, N. G. & Lunell, E. (1993). Effectiveness of nicotine patch and nicotine gum as individual versus combined treatments for tobacco withdrawal symptoms. *Psychopharmacology*, 111, 271.

- Fauzia, A. B. (2005). *A comparison of addiction and efficacy oriented messages for smoking cessation*. Ontario, Canada: University of Waterloo.
- Foulds, J., Gandhi, K. K., Steinberg, M. B., Richardson, D. L., Williams, J. M., Burke, M. V. & Rhoads, G. G. (2006). Factors associated with quitting smoking at a tobacco dependence treatment clinic. *American Journal of Health Behavior*, 30, 400.
- Gold, P. B., Rubey, R. N. & Harvey, R. T. (2002). Naturalistic, self-assignment comparative trial of bupropion SR, a nicotine patch, or both for smoking cessation treatment in primary care. *American Journal of Addiction*, 11, 315.
- Goodman, E. & Capitman, J. (2000). Depressive symptoms and cigarette smoking among teens. *Pediatrics*, 106, 748.
- Hajek, P., Taylor, T. Z. & Mills, P. (2002). Brief intervention during hospital admission to help patients to give up smoking after myocardial infarction and bypass surgery: randomised controlled trial. *British Medical Journal*, 324, 87.
- Heatherton, T. F., Kozlowski, L. T., Frecker, R. C. & Fagerstrom, K. O. (1991). The Fagerstrom Test for Nicotine Dependence: a revision of the Fagerstrom Tolerance Questionnaire. *British Journal of Addictions*, 86, 1119.
- Hirschman, R. S., Leventhal, H. & Glynn, K. (1984). The development of smoking behavior: Conceptualization and supportive cross-sectional survey data. *Journal of Applied and Social Psychology*, 14, 184.
- Hughes, J. R., Hatsukami, D. K., Mitchell, J. E. & Dahlgren, L. A. (1986). Prevalence of smoking among psychiatric outpatients. *American Journal of Psychiatry*, 143, 993.

- Hurt, R. D., Offord, K. P., Croghan, I. T., Gomez-Dahl, L., Kottke, T. E., Morse, R. M. Melton, L. J. (1996). Mortality following inpatient addictions treatment – Role of tobacco use in a community-based cohort. *Journal of the American Medical Association*, 275, 1097.
- Ikard, F. F., Green, D. E. & Horn, D. (1969). A scale to differentiate between types of smoking as related to the management of affect. *International Journal of the Addictions*, 4, 649.
- Johnson, J. G., Cohen, P., Pine, D. S., Klein, D. F., Kasen, S. & Brook, J. S. (2000). Association between cigarette smoking and anxiety disorders during adolescence and early adulthood. *Journal of the American Medical Association*, 284, 2348.
- Jorenby, D. E. (2001). Smoking cessation strategies for the 21st century. *American Heart Association*, 104, e51.
- Kalman, D. (1998). Smoking cessation treatment for substance misusers in early recovery: A review of the literature and recommendations for practice. *Substance Use and Misuse*, 33, 2021.
- Kestila, L., Koskinen, S., Martelin, T., Rahkonen, O., Pensola, T., Pirkola, S., Patja, K. & Aromaa, A. (2006). Influence of parental education, childhood adversity, and current living conditions on daily smoking in early adulthood. *European Journal of Public Health*, 16, 617.
- Kinnunen, T., Haukkala, A., Quiles, Z. N., Spiro, A. & Garvey, A. J. (2006). Depression and smoking across 25 years of the normative aging study. *International Journal of Psychiatry in Medicine*, 36, 413.

- Lovibond, S. H. & Lovibond, P. F. (1995). *Manual for the Depression Anxiety Stress Scales (2nd Ed.)*. Sydney: Psychology Foundation.
- Martin, J. E., Calfas, K. J., Patten, C. A., Polarek, M., Hofstetter, R. C., Noto, J. & Beach, D. (1997). Prospective evaluation of three smoking interventions in 205 recovering alcoholics: One-year results of project SCRAP-Tobacco. *Journal of Consulting and Clinical Psychology*, 65, 190.
- Mullins, R., Livingston, P. & Borland, R. (1999). A strategy for involving general practitioners in smoking control. *Australian and New Zealand Journal of Public Health*, 23, 249.
- Murray, R. L., Coleman, T., Antoniak, M., Stocks, J., Fergus, A., Britton, J. & Lewis, S. A. (2008). The effect of proactively identifying smokers and offering smoking cessation support in primary care populations: a cluster-randomized trial. *Addiction*, 103, 574.
- Parrot, A. C. (1993). Cigarette smoking: effects upon self-related stress and arousal over the day. *Addictive Behavior*, 18, 389.
- Parrot, A. C. (1994a). Acute pharmacodynamic tolerance to the subjective effects of cigarette smoking. *Psychopharmacology*, 116, 93.
- Parrot, A. C. (1994b). Individual differences in stress and arousal during cigarette smoking. *Psychopharmacology*, 115, 389.
- Parrot, A. C. & Garnham, N. J. (1998). Comparative mood states and cognitive skills of cigarette smokers, deprived smokers, and nonsmokers. *Human Psychopharmacology*, 13, 367.

- Patton, G. C., Hibbert, M., Rosier, M. J., Carlin, J. B., Caust, J., Bowes, G. (1996). Is smoking associated with depression and anxiety in teenagers? *American Journal of Public Health*, 86, 225..
- Pearlman, M. Y., Wernicke, R., Thorndike, F., Haaga, D. A. F. (2004). Stages of change in smoking cessation: A comparison of expectancies among precontemplators and contemplators. *Journal of Rational – Emotive & Cognitive – Behavior Therapy*, 22, 131.
- Prochaska, J. O. & Velicer, W. F. (1997). The Transtheoretical Model of health behaviour change. *American Journal of Health Promotion*, 12, 38.
- Prochaska, J. O., Velicer, W. F., Fava, J. L., Rossi, J. S. & Tsoh, J. Y. (2001). Evaluating a population-based recruitment approach and a stage-based expert system intervention for smoking cessation. *Addictive Behaviors*, 26, 583.
- Prochaska, J. O., DiClemente, C. C., Velicer, W. F. & Rossi, J. S. (1993). Standardized, individualized, interactive, and personalized self-help programs for smoking cessation. *Health Psychology*, 12, 399.
- Psychology Foundation of Australia (2006). *DASS*. Retrieved, March 20, 2008, from <http://www2.psy.unsw.edu.au/groups/dass//>
- Ryder, D., Salmon, A. & Walker, N. (2001). *Drug use and drug-related harm, a delicate balance*. Melbourne: IP Communications.
- Silagy, C., Mant, D., Fowler, G. & Lodge, M. (1994). Meta-analysis on efficacy of nicotine replacement therapies in smoking cessation. *The Lancet*, 343, 139.

Steinberg, M. B., Foulds, J., Richardson, D. L., Burke, M. V. & Shah, P. (2006).

Pharmacotherapy and smoking cessation at a tobacco dependence clinic.

Preventive Medicine, 42, 114.

West, R. & Hajek, P. (1997). What happens to anxiety levels on giving up smoking? *The*

American Journal of Psychiatry, 154, 1589.

Williams, J. M. & Ziedonis, D. (2004). Addressing tobacco among individuals with a mental illness or an addiction. *Addictive Behavior*, 29, 1067.

WHO (2007). Tobacco: *global programming note 2006-2007: Protecting future generations from the consequences of tobacco consumption and exposure to tobacco smoke*. Retrieved, March 5, 2008, from

<http://www.who.int/nmh/donorinfo/tobacco/en/index.html>

Appendix A

Please answer all questions that apply to you and use the tick boxes where provided.

1. What is your age? 18-25 ☐ 25-35 ☐ 35-45 ☐ over 45 ☐

2. What is your sex? M ☐ F ☐

3. What is your level of formal education? (Please tick box, mark all that apply)

finished primary school ☐ finished year 10 at secondary school ☐

finished year 12 at secondary school ☐ completed TAFE course ☐

completed university degree ☐ other ☐

4. How long have you been living at Cyrenian House? 0-4 weeks ☐ 4-8 weeks ☐

8-12 weeks ☐ 12-16 weeks ☐ 16-20 weeks ☐ over 20 weeks ☐

5. What was your main drug of concern for entering Cyrenian House? Alcohol ☐

cannabis ☐ amphetamines ☐ heroin ☐ other opiates ☐ benzos ☐

6. Do you currently smoke cigarettes? Y ☐ N ☐

7. Have you ever smoked cigarettes? Y ☐ N ☐ (only continue if answer is yes)

8. About what age were you when you smoked your first full cigarette? Under 6 ☐

6-10 ☐ 10-14 ☐ 14-18 ☐ over 18 ☐

9. At what age did you first start smoking on a daily basis? Under 6 ☐ 6-10 ☐

10-14 ☐ 14-18 ☐ 18-25 ☐ over 25 ☐

10. During the last 12 months, did you find that you couldn't stop smoking, even though you want to or tried to? Y ☐ N ☐

11. During the last 12 months, did you find that you couldn't cut down on your smoking, even though you want to or tried to? Y ☐ N ☐

12. Do you want to smoke now? Y ☐ N ☐

13. In the past have you....? (tick all that apply)

Given up smoking (for more than a month) ☐

Tried to give up unsuccessfully ☐

Changed to a brand with lower tar or nicotine content ☐

Tried to change to a brand with lower tar or nicotine content, but unsuccessfully ☐

Reduced the amount of tobacco you smoke in a day ☐

Tried to reduce the amount of tobacco you smoke in a day, but unsuccessfully ☐

None of these ☐ (skip to question 20)

14. Which of the following motivated you to try giving up, cutting down or changing to a lower tar or nicotine brand? (tick all that apply)

Health warnings on cigarette packets ☐ Quit advertisements on TV ☐

Quit advertisements on radio ☐ Quit advertisements in newspapers etc ☐

Advertisements for nicotine replacement products eg nicotine gum, patches, Zyban ☐

QUIT line (phone number on cigarette packet) ☐

I wanted to get fit ☐ I was pregnant or wanting to start a family ☐

I thought it was affecting my health or fitness ☐ My doctor advised me to give up ☐

Family and/or friends asked me to quit ☐

I was worried it was affecting the health of those around me ☐

It was costing too much money ☐

Smoking bans in public areas (e.g. restaurants, sporting venues etc.) ☐

Smoking bans at work ☐ Other ☐

15. Do you plan on giving up smoking....?

Not in the next 6 months ☐ in the next 6 months ☐ in the next month ☐

I quit smoking within the last 6 months ☐ I quit smoking over 6 months ago ☐

Table I. Intercorrelations for the variables

	D	A	S	ND	Age	Gen	Edu	LS	AFC	ASD	CS	CCD	WTS	SOC	SDS	Mot	OSA	QS	CuS	ES	DOC
D	†1.00																				
A	†0.69**	†1.00																			
S	†0.64**	†0.84**	†1.00																		
ND	†0.10	†0.30	†0.45*	†1.00																	
Age	-0.26	-0.45*	0.12	0.16	1.00																
Gen	0.08	0.25	0.18	-0.02	-0.27	1.00															
Edu	-0.25	-0.31	-0.25	-0.06	0.40*	-0.22	1.00														
LS	-0.35	-0.40*	-0.31	-0.23	-0.06	0.05	-0.23	1.00													
AFC	-0.17	-0.07	-0.14	0.23	0.13	0.11	0.48**	-0.18	1.00												
ASD	-0.20	-0.39	-0.40*	-0.32	0.08	0.00	0.49**	0.10	0.59**	1.00											
CS	-0.18	-0.21	-0.10	-0.09	-0.09	-0.08	0.05	0.09	-0.14	0.05	1.00										
CCD	-0.24	-0.30	-0.27	-0.21	0.02	-0.18	0.10	0.03	-0.09	0.28	0.35	1.00									
WTS	-0.04	-0.13	-0.28	-0.02	0.10	0.15	0.02	-0.09	0.13	0.10	0.08	-0.29	1.00								
SOC	0.08	-0.15	-0.15	-0.12	0.11	-0.08	-0.11	-0.09	-0.17	0.07	-0.23	-0.04	0.42*	1.00							
SDS	-0.39*	-0.20	-0.32	-0.41*	0.04	0.06	0.23	0.19	0.20	0.44*	-0.19	0.06	-0.06	0.01	1.00						
Mot	-0.05	-0.18	-0.22	-0.02	0.31	0.04	0.26	0.05	0.07	0.08	-0.21	-0.21	0.45*	0.62**	-0.07	1.00					
OSA	0.12	-0.03	0.03	0.02	0.05	0.28	-0.01	0.10	0.20	0.10	0.09	-0.27	0.13	-0.14	0.10	-0.23	1.00				
QS	0.03	0.02	0.15	0.14	0.18	-0.05	0.12	0.15	0.03	-0.09	0.08	-0.03	-0.35	-0.71**	-0.02	-0.52**	0.49**	1.00			
CuS	0.03	-0.41*	-0.36	-0.51**	0.06	0.00	0.21	-0.09	-0.24	0.08	-0.09	-0.17	0.28	0.37	-0.08	0.31	0.21	-	1.00		
ES	-0.15	-0.31	-0.30	-0.41*	0.12	-0.09	0.37*	-0.32	-	-	-	-	-	-	-	-	-	-	0.80**	1.00	
DOC	-0.07	0.14	0.11	-0.06	-0.21	0.38*	-0.35	0.22	-0.31	-0.18	-0.01	0.11	-0.07	-0.08	0.12	-0.08	0.03	-0.05	-0.16	-0.31	1.00
Mean	13.43	12.33	17.63	5.63																	
SD	10.53	9.35	10.57	2.83																	
N	30	30	30	30																	

† Pearson *r* measure of correlation; ** = $p < 0.01$; * = $p < 0.05$ (Pearson *r* and Spearman rho); D, Depression; A, Anxiety; S, Stress; ND, Nicotine Dependence; Gen, Gender; Edu, Education; LS, Length of Stay; AFC, Age of First Cigarette; ASD, Age of Starting Smoking Daily; CS, Couldn't Stop Smoking; CCD, Couldn't Cut Down Smoking; WTS, Want to Smoke; SOC, Stage of Change; SDS, Smoking Decreases Stress; Mot, Entering the TC Motivation to Quit Smoking; OSA, One Smoke Area; QS, Quit Support; ES, Ever Smoker; CuS, Current Smoker; DOC, Drug of Choice

Discussion

The present study aimed to test the research question: Do symptoms of anxiety, depression and stress increase as nicotine dependence increases? It was hypothesised that as the level of nicotine dependence increases, symptoms of anxiety, depression and stress will also increase. The findings of the present study only partially support the hypothesis. There was a moderate significant positive relationship found between nicotine dependence and stress. This finding is consistent with previous research that has shown that smoking actually exacerbates stress and that more dependent smokers are more stressed (Parrot & Garnham, 1998; Parrot, 1993; Parrot, 1994a; Parrot, 1994b). Previous research has found that, contrary to commonly held beliefs in the addictions field, smoking cessation amongst people in alcohol and other drug treatment does not jeopardise their treatment and has actually shown to improve treatment outcomes (Bobo et al., 1998; Martin et al., 1997; Burling et al., 1991). The present study showed that the more nicotine dependent individuals were in the TC, the more likely they were to have higher stress levels. Previous research has shown that ceasing smoking actually results in a decrease in stress levels for the abstaining smoker (Carey et al., 1993; Cohen and Lichtenstein, 1990; Parrot, 1995). Therefore, if the residents were ceasing smoking during their stay in the TC they may have lower stress levels and consequently may be better equipped to achieve successful treatment outcomes.

Previous research has found that the more dependent an individual is on nicotine, the more they will report they rely on smoking for stress release (Parrot, 1994b). The present study supports this research. There was a significant moderate negative relationship found between nicotine dependence and whether an individual thinks that

smoking decreases their stress levels. This indicated that the more dependent participants were on smoking, the more likely they were to answer 'yes' to the whether they think smoking decreases their stress levels. All the participants apart from one who scored five or more on the nicotine dependence scale said they thought smoking decreases their stress levels. In contrast, out of the five people who scored less than five on the nicotine dependence scale, only two answered 'yes' and three answered 'no'. In addition to this, there was a significant moderate relationship found between participants' age of first smoking daily and whether they think smoking decreases their stress levels. This indicates that the younger participants were when they started smoking daily, the more likely they are to rely on smoking for stress release, suggesting that they are generally more stressed.

Although there was a relationship found between nicotine dependence and stress, there were no significant relationships found between nicotine dependence and depression and anxiety. It is unclear why there was no relationship between nicotine dependence and anxiety or depression. One possible explanation is that much of the education that is delivered in the TC is based on cognitive-behavioural therapy (CBT), which teaches techniques around reducing these symptoms. The lower scores for anxiety and depression in comparison to stress could be attributable to the residents using CBT effectively. In addition to this, it could also be that the participants in the TC were in a positive frame of mind because their lives are heading in a better direction by being a part of the TC, therefore reporting lower depressive and anxiety symptoms.

The non significant results from the ANOVA indicate that there was not a significant difference between the anxiety, depression and stress scores of people who

had entered the TC dependent on alcohol and people who were dependent on alcohol and/or other drugs. Nonetheless, the present study demonstrated that the residents of the TC in general, experience higher levels of affective distress than that of the general population. The means from a sample of 2914 adults from the general population on measures of depression, anxiety, and stress were 6.34, 4.70, and 10.11 respectively (Lovibond & Lovibond, 1995). The means for depression, anxiety and stress from the present study were 13.43, 12.33, and 17.63 respectively. The mean for depression fell into the mild category, the mean for anxiety fell into the moderate category and the mean for stress fell into the mild category. Stress scores were the highest out of the three scores. This is consistent with the measure with the cut-offs for the different categories being the highest for stress followed by depression and then anxiety.

Previous research has found rates of smoking among individuals with substance use disorders to be double to triple that of the general community (Batel, Pessione, Maitre & Rueff, 1995). The first results of the NDSHS revealed that in 2007, 16.6% of the population aged 14 years or older reported smoking daily (AIHW, 2007). The present study found that 90% of participants were smoking daily. Although the participants in the present study were aged 18 years or older and the population included in the NDSHS were aged 14 years or older, this finding is still important and supports past research that has suggested that the rates of smoking are much higher amongst individuals with substance use disorders than that of the general community.

Support for the “stages of change” theory came from the present study. There was a significant moderate positive relationship found between participants’ stage of change and whether they want to smoke presently. This indicates that the participants in the

earlier stages of change were more likely to want to smoke and the participants in the later stages of change were less likely to want to smoke, supporting the concept that when people are in precontemplation they can be regarded as 'happy users' (Prochaska & Velicer, 1997). In addition, there was a significant strong positive relationship between participants' stage of change and how much entering the TC motivated them to quit smoking. This indicates that for the individuals in the early stages of change, entering the TC was less likely to motivate them to quit smoking, and for the individuals in the later stages of change, entering the TC was more likely to motivate them to quit smoking. Furthermore, there was a significant strong negative relationship found between participants' stage of change and whether they would use quit support if it was offered to them during their stay in the TC. This indicates that the participants in the later stages of change were much more likely to utilise quit support if offered to them during their stay in the TC. These findings support the idea that people in the later stages of change are more consciously thinking about quitting smoking and are consistent with previous research regarding the stages of change theory (Brogan, Prochaska and Prochaska, 1999; DiClemente et al., 1991; Pearlman, Wernicke, Thorndike and Haaga, 2004; Prochaska et al., 1994; Prochaska, Velicer, Fava, Rossi and Tsoh, 2001).

Although weak, a significant negative relationship was found between participants' stage of change and nicotine dependence. This indicated that participants in the later stages of change tended to have lower scores on the nicotine dependence scale suggesting that it may be easier for these individuals to be thinking about or planning on quitting if their nicotine dependence is not so high. The relationship may also be a result

of these individuals smoking less in preparation for quitting smoking and therefore having a lower level of nicotine dependence.

There was a significant moderate positive relationship found between age of first cigarette and age of starting smoking daily. This finding indicates that the older participants were when they tried their first cigarette, the older they were when they started smoking daily. For example, a large proportion of the participants that tried their first cigarette between ages 10-14, started smoking daily between ages 14-18. There was also a weak significant negative relationship found between age of starting smoking daily and stress, as well as a weak significant negative relationship found between age of starting smoking daily and anxiety. This indicates that as age of starting smoking daily increases, stress and anxiety decreases. Therefore, the younger participants were when they had taken up smoking regularly, the more likely they were to have high stress and anxiety levels presently. This is in line with previous research that suggests that taking up regular smoking at a young age can have worse mental health outcomes than taking up regular smoking at an older age (Hirschman et al., 1984; Johnson et al., 2000). Further supporting these findings was the significant moderate positive relationship found between participants' age of starting smoking daily and whether they think that smoking decreases their stress levels. This relationship indicates that the older participants were when they started smoking daily the more likely they were to report that they do not think that smoking decreases their stress levels. These findings highlight the importance of preventing youth from experimenting with smoking.

Research has found socioeconomic status and education level to be a predictor of smoking, as well as a predictor of success at smoking cessation (Blakey & Wilson, 2005;

Foulds et al., 2006; Kestila et al., 2006). The findings from the present study support previous research. Significant moderate positive relationships were found between education and participants' age of first cigarette use and age of first smoking daily, indicating that the higher the level of education obtained by participants, the older they were more likely to be when they tried their first cigarette and when they started smoking daily. In addition, there was also a significant weak positive correlation found between education and participants having ever smoked, indicating that the higher the level of education obtained by participants, the less likely they were to have ever smoked. This could also be seen from screening the data: both never smokers being two of only five participants who had university degrees. Interestingly, in addition to this, one of the other three participants that had a university degree only had a score of one on the nicotine dependence scale. Previous research has suggested that the effect of socioeconomic background on smoking is a result of the social environment of those with a lower socioeconomic background (Foulds et al., 2006). For example, those with a lower socioeconomic background are less likely to work in smoke-free environments and are more likely to have friends and family who smoke. This is likely the case for the present study.

Previous research has shown NRT to be an effective strategy to assist people to quit smoking (Gold et al., 2002; Jorenby, 2001; Silagy et al., 1994). The findings from the present study further support past research. It was found that of the 13 people that had used NRT in the past, nine of those found NRT to be effective in helping to quit smoking. However, all of these individuals were currently smoking so therefore the NRT did not have a lasting effect which is also consistent with previous research (Silagy et al.). The

next most common strategy that people had used in the past was asking their doctor for help to quit. However, of the seven people who did this only three said that it had been effective. This is also in line with previous research that has found brief interventions delivered by doctors to be ineffective in helping people to quit (Hajek et al., 2002; Murray et al., 2008).

Participants were also asked what had motivated them to quit smoking in the past. The most common answers were 'it was costing too much money', 'I wanted to get fit', 'it was affecting my fitness', as well as 'I was pregnant or wanting to start a family'. These answers were markedly more frequent than the health warnings or quit advertisements on TV answers. This information could be useful in the development of strategies to motivate people to quit smoking.

When asked why they don't intend to quit the most frequent answer given by participants was 'I am addicted to nicotine' followed closely by 'I enjoy smoking' and 'smoking relaxes me'. This is consistent with previous research that has found that smokers indicate that smoking relaxes them and that they enjoy smoking (Ikard et al., 1969). This further supports the concept that smoking contributes to stress levels in the smoker, in that their general stress levels are higher and smoking brings their stress levels back to the same as a non smoker's general stress levels (Parrot, 1993; Parrot, 1994a; Parrot, 1994b). However, smoking is more likely to contribute to high stress levels than it is to relieving stress. Smokers probably perceive smoking to relieve their stress because they get relief almost immediately when they light a cigarette. But this relief is more likely to be related to nicotine levels in the blood being increased as soon as a cigarette is lit (i.e. with the first puff). So what smokers perceive as stress relief is actually relief

from the feeling they get when they have gone without a cigarette for a period of time. This is a result of the physical dependence that occurs from nicotine use.

Findings of importance for Cyrenian House include the finding regarding participants' views towards quit support. Of the participants that responded to the question, 48.1% indicated that they would use quit support if it were offered to them during their stay in the TC. This finding goes against the commonly held belief that people seeking AOD treatment are only interested in dealing with their AOD dependencies and do not want to address their smoking. The relationship found between participants' stage of change and whether they would use quit support also suggests that a large proportion of the other 51.9% who indicated that they would not use quit support are likely part of the 57.1% of participants that were in precontemplation. Therefore, these individuals could be given education to move them into preparation and then could be offered quit support by way of NRT. In addition, there was a significant moderate positive relationship found between whether participants want to smoke and how much entering the TC motivated them to quit smoking, indicating that the participants that reported not wanting to smoke were more likely to report that entering the TC motivated them to quit smoking. There was also a significant moderate negative relationship found between how much entering the TC motivated participants to quit smoking and whether they would use quit support if offered to them. This indicates that the participants who reported being motivated to quit smoking would be more likely to use quit support if it was offered to them. Moreover, a significant moderate positive relationship was also found between whether participants would use quit support if offered to them and the effect that having one smoking area in the TC would have on their smoking. This

indicates that those who reported that they would not use quit support were more likely to report that having one smoking area in the TC would reduce their smoking largely.

Other noteworthy findings include the significant negative moderate relationship found between age and anxiety, indicating that the younger the participants were the more likely they were to have higher anxiety scores. Moreover, there was a significant negative moderate relationship also found between length of stay and anxiety, indicating that the less time participants had been residents of the TC the more likely they were to have higher anxiety scores. This finding stands to reason, in that people would be more anxious in their first few weeks of entering a rehabilitation program, whether from experiencing withdrawal symptoms or from adjusting to a foreign environment.

There are some limitations with the present study. Firstly, all data was gathered via self-report so it could not be certain that participants answered all questions honestly. Secondly, participants in a residential drug rehabilitation setting are likely to experience negative affect due to withdrawal from alcohol and other drugs. This may have influenced the participants' scores on the DASS instrument. Finally, a sample size of more than 30 participants would have been desirable. However, there are normally only 25 to 30 residents staying in the TC at any one time and due to the unique nature of the setting it was not feasible to recruit participants from other residential rehabilitation centres. The fact that all participants were from Cyrenian House TC was also a strength of the present study. The findings may inform Cyrenian House as to the most appropriate action to undertake regarding smoking cessation and intervention. Another strength of the study was the measure of the effect of nicotine on mental health. Most other studies on the effect of nicotine on mental health symptoms have not been conducted on individuals

living in a TC for alcohol and other drug rehabilitation. Residents of the TC are not permitted to use alcohol or other drugs that are not prescribed during their stay. In contrast, other studies would likely not have been able to control for their participants using alcohol or other drugs and therefore may have had results that were influenced by their participants using alcohol or other drugs. Therefore, in this sense, the present study is a more pure measure of the effect of nicotine on mental health.

In conclusion, the findings from the present study suggest that smoking may be contributing to the TC residents' stress levels. Therefore, if smoking intervention can reduce symptoms of stress for residents it may result in better treatment outcomes. For those residents assessed as being in the early stages of change, interventions could focus on moving residents through the stages of change before incorporating smoking cessation. Interventions could include education around the negative health consequences of smoking as well as education around the less commonly known mental health problems associated with smoking. In addition, the education could also incorporate some stress management techniques. Residents assessed as being ready to change their smoking behaviour, along with residents who have received intervention, could be offered smoking cessation, with the aid of NRT. This may result in lower symptoms of stress due to the fact they would be receiving a consistent amount of nicotine throughout the day instead of intermittent periods of heavy smoking. To incorporate smoking intervention and cessation into the TC program and assess residents' symptoms of anxiety, depression and stress pre and post intervention and cessation would be a useful direction for future research.

References

- Australian Institute of Health and Welfare (2008). *The 2007 National Drug Strategy Household Survey: first results*. Drug Statistics Series number 20. Cat. no. PHE 98. Canberra: AIHW.
- Batel, P., Pessione, F., Maitre, C. & Rueff, B. (1995). Relationship between alcohol and tobacco dependencies among alcoholics who smoke. *Addiction*, 9, 977.
- Bergen, A. W. & Caporaso, N. (1999). Cigarette smoking. *Journal of the National Cancer Institute*, 91, 1365.
- Blakely, T. & Wilson, N. (2005). The contribution of smoking to inequalities in mortality by education varies over time and by sex: Two national cohort studies, 1981-84 and 1996-99. *International Journal of Epidemiology*, 34, 1054.
- Bobo, J. K., McIlvain, H. E., Lando, H. A., Walker, R. D. & Leed-Kelly, A. (1998). Effect of smoking cessation counseling on recovery from alcoholism: findings from a randomized community intervention trial. *Addiction*, 93, 877
- Brigham, G. S., Schroeder, G. & Schindler, E. (2007). Addressing smoking in community drug abuse treatment programs: Practical and policy considerations. *Journal of Psychoactive Drugs*, 39, 435.
- Brogan, M. M., Prochaska, J. O. & Prochaska, J. M. (1999). Predicting termination and continuation status in psychotherapy using the transtheoretical model. *Psychotherapy*, 36, 105
- Burling, T. A., Marshall, G. D. & Seidner, A. L. (1991). Smoking cessation for substance abuse inpatients. *Journal of Substance Abuse*, 3, 269.

- Campbell, B. K., Wander, N., Stark, M. J. & Holbert, T. (1995). Treating cigarette smoking in drug-abusing clients. *Journal of Substance Abuse Treatment*, 12, 89.
- Carey, M. P., Kalra, D. L., Carey, K. B., Halperin, S. & Richards, C. S. (1993). Stress and unaided smoking cessation: A prospective investigation. *Journal of Consulting and Clinical Psychology*, 61, 831.
- Cohen, S. & Lichtenstein, E. (1990). Perceived stress, quitting smoking, and smoking relapse. *Health Psychology*, 9, 466.
- Croghan, G. A., Sloan, J. A., Croghan, I. T., Novotny, P., Hurt, R. D., DeKrey, W. L., Mailliard, J. A., Ebbert, L. P., Swan, D. K., Walsh, D. J., Wiesenfeld, M., Levitt, R., Stella, P., Johnson, P. A., Tschetter, L. K. & Loprinzi, C. (2003). Comparison of nicotine patch alone versus nicotine nasal spray alone versus a combination for treating smokers: A minimal intervention, randomized, multicenter trial in a nonspecialized setting. *Nicotine and Tobacco Research*, 5, 181.
- DiClemente, C. C., Prochaska, J. O., Fairhurst, S. K., Velicer, W. F., Velasquez, M. M. & Rossi, J. S. (1991). The process of smoking cessation: An analysis of precontemplation, contemplation, and preparation stages of change. *Journal of Consulting and Clinical Psychology*, 59, 295.
- Epping-Jordan, M. P., Watkins, S. S., Koob, G. F. & Markou, A. (1998). Dramatic decreases in brain reward function during nicotine withdrawal. *Nature*, 76, 393.
- Fagerstrom, K. O., Schneider, N. G. & Lunell, E. (1993). Effectiveness of nicotine patch and nicotine gum as individual versus combined treatments for tobacco withdrawal symptoms. *Psychopharmacology*, 111, 271.

- Fauzia, A. B. (2005). *A comparison of addiction and efficacy oriented messages for smoking cessation*. Ontario, Canada: University of Waterloo.
- Foulds, J., Gandhi, K. K., Steinberg, M. B., Richardson, D. L., Williams, J. M., Burke, M. V. & Rhoads, G. G. (2006). Factors associated with quitting smoking at a tobacco dependence treatment clinic. *American Journal of Health Behavior*, 30, 400.
- Gold, P. B., Rubey, R. N. & Harvey, R. T. (2002). Naturalistic, self-assignment comparative trial of bupropion SR, a nicotine patch, or both for smoking cessation treatment in primary care. *American Journal of Addiction*, 11, 315.
- Goodman, E. & Capitman, J. (2000). Depressive symptoms and cigarette smoking among teens. *Pediatrics*, 106, 748.
- Hajek, P., Taylor, T. Z. & Mills, P. (2002). Brief intervention during hospital admission to help patients to give up smoking after myocardial infarction and bypass surgery: randomised controlled trial. *British Medical Journal*, 324, 87.
- Heatherton, T. F., Kozlowski, L. T., Frecker, R. C. & Fagerstrom, K. O. (1991). The Fagerstrom Test for Nicotine Dependence: a revision of the Fagerstrom Tolerance Questionnaire. *British Journal of Addictions*, 86, 1119.
- Hirschman, R. S., Leventhal, H. & Glynn, K. (1984). The development of smoking behavior: Conceptualization and supportive cross-sectional survey data. *Journal of Applied and Social Psychology*, 14, 184.
- Hughes, J. R., Hatsukami, D. K., Mitchell, J. E. & Dahlgren, L. A. (1986). Prevalence of smoking among psychiatric outpatients. *American Journal of Psychiatry*, 143, 993.

- Hurt, R. D., Offord, K. P., Croghan, I. T., Gomez-Dahl, L., Kottke, T. E., Morse, R. M. Melton, L. J. (1996). Mortality following inpatient addictions treatment – Role of tobacco use in a community-based cohort. *Journal of the American Medical Association*, 275, 1097.
- Ikard, F. F., Green, D. E. & Horn, D. (1969). A scale to differentiate between types of smoking as related to the management of affect. *International Journal of the Addictions*, 4, 649.
- Johnson, J. G., Cohen, P., Pine, D. S., Klein, D. F., Kasen, S. & Brook, J. S. (2000). Association between cigarette smoking and anxiety disorders during adolescence and early adulthood. *Journal of the American Medical Association*, 284, 2348.
- Jorenby, D. E. (2001). Smoking cessation strategies for the 21st century. *American Heart Association*, 104, e51.
- Kalman, D. (1998). Smoking cessation treatment for substance misusers in early recovery: A review of the literature and recommendations for practice. *Substance Use and Misuse*, 33, 2021.
- Kestila, L., Koskinen, S., Martelin, T., Rahkonen, O., Pensola, T., Pirkola, S., Patja, K. & Aromaa, A. (2006). Influence of parental education, childhood adversity, and current living conditions on daily smoking in early adulthood. *European Journal of Public Health*, 16, 617.
- Kinnunen, T., Haukkala, A., Quiles, Z. N., Spiro, A. & Garvey, A. J. (2006). Depression and smoking across 25 years of the normative aging study. *International Journal of Psychiatry in Medicine*, 36, 413.

- Lovibond, S. H. & Lovibond, P. F. (1995). *Manual for the Depression Anxiety Stress Scales (2nd Ed.)*. Sydney: Psychology Foundation.
- Martin, J. E., Calfas, K. J., Patten, C. A., Polarek, M., Hofstetter, R. C., Noto, J. & Beach, D. (1997). Prospective evaluation of three smoking interventions in 205 recovering alcoholics: One-year results of project SCRAP-Tobacco. *Journal of Consulting and Clinical Psychology*, 65, 190.
- Mullins, R., Livingston, P. & Borland, R. (1999). A strategy for involving general practitioners in smoking control. *Australian and New Zealand Journal of Public Health*, 23, 249.
- Murray, R. L., Coleman, T., Antoniak, M., Stocks, J., Fergus, A., Britton, J. & Lewis, S. A. (2008). The effect of proactively identifying smokers and offering smoking cessation support in primary care populations: a cluster-randomized trial. *Addiction*, 103, 574.
- Parrot, A. C. (1993). Cigarette smoking: effects upon self-related stress and arousal over the day. *Addictive Behavior*, 18, 389.
- Parrot, A. C. (1994a). Acute pharmacodynamic tolerance to the subjective effects of cigarette smoking. *Psychopharmacology*, 116, 93.
- Parrot, A. C. (1994b). Individual differences in stress and arousal during cigarette smoking. *Psychopharmacology*, 115, 389.
- Parrot, A. C. & Garnham, N. J. (1998). Comparative mood states and cognitive skills of cigarette smokers, deprived smokers, and nonsmokers. *Human Psychopharmacology*, 13, 367.

- Patton, G. C., Hibbert, M., Rosier, M. J., Carlin, J. B., Caust, J., Bowes, G. (1996). Is smoking associated with depression and anxiety in teenagers? *American Journal of Public Health*, 86, 225..
- Pearlman, M. Y., Wernicke, R., Thorndike, F., Haaga, D. A. F. (2004). Stages of change in smoking cessation: A comparison of expectancies among precontemplators and contemplators. *Journal of Rational – Emotive & Cognitive – Behavior Therapy*, 22, 131.
- Prochaska, J. O. & Velicer, W. F. (1997). The Transtheoretical Model of health behaviour change. *American Journal of Health Promotion*, 12, 38.
- Prochaska, J. O., Velicer, W. F., Fava, J. L., Rossi, J. S. & Tsoh, J. Y. (2001). Evaluating a population-based recruitment approach and a stage-based expert system intervention for smoking cessation. *Addictive Behaviors*, 26, 583.
- Prochaska, J. O., DiClemente, C. C., Velicer, W. F. & Rossi, J. S. (1993). Standardized, individualized, interactive, and personalized self-help programs for smoking cessation. *Health Psychology*, 12, 399.
- Psychology Foundation of Australia (2006). *DASS*. Retrieved, March 20, 2008, from <http://www2.psy.unsw.edu.au/groups/dass//>
- Ryder, D., Salmon, A. & Walker, N. (2001). *Drug use and drug-related harm, a delicate balance*. Melbourne: IP Communications.
- Silagy, C., Mant, D., Fowler, G. & Lodge, M. (1994). Meta-analysis on efficacy of nicotine replacement therapies in smoking cessation. *The Lancet*, 343, 139.

Steinberg, M. B., Foulds, J., Richardson, D. L., Burke, M. V. & Shah, P. (2006).

Pharmacotherapy and smoking cessation at a tobacco dependence clinic.

Preventive Medicine, 42, 114.

West, R. & Hajek, P. (1997). What happens to anxiety levels on giving up smoking? *The*

American Journal of Psychiatry, 154, 1589.

Williams, J. M. & Ziedonis, D. (2004). Addressing tobacco among individuals with a mental illness or an addiction. *Addictive Behavior*, 29, 1067.

WHO (2007). Tobacco: *global programming note 2006-2007: Protecting future generations from the consequences of tobacco consumption and exposure to tobacco smoke*. Retrieved, March 5, 2008, from

<http://www.who.int/nmh/donorinfo/tobacco/en/index.html>

Appendix A

Please answer all questions that apply to you and use the tick boxes where provided.

1. What is your age? 18-25 ☐ 25-35 ☐ 35-45 ☐ over 45 ☐

2. What is your sex? M ☐ F ☐

3. What is your level of formal education? (Please tick box, mark all that apply)

finished primary school ☐ finished year 10 at secondary school ☐

finished year 12 at secondary school ☐ completed TAFE course ☐

completed university degree ☐ other ☐

4. How long have you been living at Cyrenian House? 0-4 weeks ☐ 4-8 weeks ☐

8-12 weeks ☐ 12-16 weeks ☐ 16-20 weeks ☐ over 20 weeks ☐

5. What was your main drug of concern for entering Cyrenian House? Alcohol ☐

cannabis ☐ amphetamines ☐ heroin ☐ other opiates ☐ benzos ☐

6. Do you currently smoke cigarettes? Y ☐ N ☐

7. Have you ever smoked cigarettes? Y ☐ N ☐ (only continue if answer is yes)

8. About what age were you when you smoked your first full cigarette? Under 6 ☐

6-10 ☐ 10-14 ☐ 14-18 ☐ over 18 ☐

9. At what age did you first start smoking on a daily basis? Under 6 ☐ 6-10 ☐

10-14 ☐ 14-18 ☐ 18-25 ☐ over 25 ☐

10. During the last 12 months, did you find that you couldn't stop smoking, even though you want to or tried to? Y ☐ N ☐

11. During the last 12 months, did you find that you couldn't cut down on your smoking, even though you want to or tried to? Y ☐ N ☐

12. Do you want to smoke now? Y ☐ N ☐

13. In the past have you....? (tick all that apply)

Given up smoking (for more than a month) ☐

Tried to give up unsuccessfully ☐

Changed to a brand with lower tar or nicotine content ☐

Tried to change to a brand with lower tar or nicotine content, but unsuccessfully ☐

Reduced the amount of tobacco you smoke in a day ☐

Tried to reduce the amount of tobacco you smoke in a day, but unsuccessfully ☐

None of these ☐ (skip to question 20)

14. Which of the following motivated you to try giving up, cutting down or changing to a lower tar or nicotine brand? (tick all that apply)

Health warnings on cigarette packets ☐ Quit advertisements on TV ☐

Quit advertisements on radio ☐ Quit advertisements in newspapers etc ☐

Advertisements for nicotine replacement products eg nicotine gum, patches, Zyban ☐

QUIT line (phone number on cigarette packet) ☐

I wanted to get fit ☐ I was pregnant or wanting to start a family ☐

I thought it was affecting my health or fitness ☐ My doctor advised me to give up ☐

Family and/or friends asked me to quit ☐

I was worried it was affecting the health of those around me ☐

It was costing too much money ☐

Smoking bans in public areas (e.g. restaurants, sporting venues etc.) ☐

Smoking bans at work ☐ Other ☐

15. Do you plan on giving up smoking....?

Not in the next 6 months ☐ in the next 6 months ☐ in the next month ☐

I quit smoking within the last 6 months ☐ I quit smoking over 6 months ago ☐

16. Why don't you intend to quit? (Please tick all that apply)

I enjoy smoking ☐ smoking relaxes me ☐ I am addicted to nicotine ☐
smoking is not as bad for my health as people say ☐
smoking helps manage my weight ☐ other ☐

17. Do you think that smoking decreases your stress levels? Y ☐ N ☐

18. What would motivate you to quit? (Please tick all that apply)

Advice from my doctor ☐ family/parents/partner ☐ affecting my fitness ☐
ill health ☐ pregnancy ☐ children in the home ☐ other ☐

19. During the last twelve months have you done any of the following? (tick all that apply)

Rung the 'QUIT' line ☐ Asked your doctor for help to quit ☐

Used nicotine gum, nicotine patch or nicotine inhaler ☐

Used a smoking cessation pill ☐

Bought a product other than nicotine patch, gum or pill to help you quit ☐

Read 'how to quit' literature ☐ Used the internet to help you quit ☐

Done something else to help you quit ☐ None of the above ☐

Don't know ☐

20. If so, please tick any of the following that you found to be effective

Rung the 'QUIT' line ☐ Asked your doctor for help to quit ☐

Used nicotine gum, nicotine patch or nicotine inhaler ☐

Used a smoking cessation pill ☐

Bought a product other than nicotine patch, gum or pill to help you quit ☐

Read 'how to quit' literature ☐ Used the internet to help you quit ☐

Don't know ☐

21. To what extent has entering Cyrenian House motivated you to give up smoking?

Not at all ☐ not sure ☐ very much ☐

22. What impact do you think having only one designated smoking area at Cyrenian House would have on your smoking?

Reduce it slightly ☐ Reduce it largely ☐ No impact ☐

23. Would you attempt to quit smoking during your stay at Cyrenian House if quit support was offered to you? Y ☐ N ☐

Appendix B

Fagerstrom Test for Nicotine Dependence *

Please answer the following questions by ticking the appropriate box.

1. How soon after you wake up do you smoke your first cigarette?

◆ After 60 minutes ☐

(0)

◆ 31-60 minutes ☐

(1)

◆ 6-30 minutes ☐

(2)

◆ Within 5 minutes ☐

(3)

2. Do you find it difficult to refrain from smoking in places where it is forbidden?

◆ No ☐

(0)

◆ Yes ☐

(1)

3. Which cigarette would you hate most to give up?

◆ The first in the morning ☐

(1)

◆ Any other ☐

(0)

4. How many cigarettes per day do you smoke?

◆ 10 or less ☐

(0)

◆ 11-20 ☐

(1)

◆ 21-30 ☐

(2)

◆ 31 or more ☐

(3)

Please answer the following questions by ticking the appropriate box

5. Do you smoke more frequently during the first hours after awakening than during the rest of the day?

♦ No ☐

(0)

♦ Yes ☐

(1)

6. Do you smoke even if you are so ill that you are in bed most of the day?

♦ No ☐

(0)

♦ Yes ☐

(1)

* Heatherton TF, Kozlowski LT, Frecker RC, **Fagerstrom** KO. The **Fagerstrom** Test for Nicotine Dependence: A revision of the **Fagerstrom** Tolerance Questionnaire. British Journal of Addictions 1991;86:1119-27

Appendix C

DASS

Name:

Date:

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

- 0 Did not apply to me at all
- 1 Applied to me to some degree, or some of the time
- 2 Applied to me to a considerable degree, or a good part of time
- 3 Applied to me very much, or most of the time

1	I found myself getting upset by quite trivial things	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I just couldn't seem to get going	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I had a feeling of shakiness (eg, legs going to give way)	0	1	2	3
8	I found it difficult to relax	0	1	2	3
9	I found myself in situations that made me so anxious I was most relieved when they ended	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting upset rather easily	0	1	2	3
12	I felt that I was using a lot of nervous energy	0	1	2	3
13	I felt sad and depressed	0	1	2	3
14	I found myself getting impatient when I was delayed in any way (eg, lifts, traffic lights, being kept waiting)	0	1	2	3
15	I had a feeling of faintness	0	1	2	3
16	I felt that I had lost interest in just about everything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3

19	I perspired noticeably (eg, hands sweaty) in the absence of high temperatures or physical exertion	0	1	2	3
20	I felt scared without any good reason	0	1	2	3
21	I felt that life wasn't worthwhile	0	1	2	3

Reminder of rating scale:

- 0 Did not apply to me at all
- 1 Applied to me to some degree, or some of the time
- 2 Applied to me to a considerable degree, or a good part of time
- 3 Applied to me very much, or most of the time

22	I found it hard to wind down	0	1	2	3
23	I had difficulty in swallowing	0	1	2	3
24	I couldn't seem to get any enjoyment out of the things I did	0	1	2	3
25	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3
26	I felt down-hearted and blue	0	1	2	3
27	I found that I was very irritable	0	1	2	3
28	I felt I was close to panic	0	1	2	3
29	I found it hard to calm down after something upset me	0	1	2	3
30	I feared that I would be "thrown" by some trivial but unfamiliar task	0	1	2	3
31	I was unable to become enthusiastic about anything	0	1	2	3
32	I found it difficult to tolerate interruptions to what I was doing	0	1	2	3
33	I was in a state of nervous tension	0	1	2	3
34	I felt I was pretty worthless	0	1	2	3
35	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
36	I felt terrified	0	1	2	3
37	I could see nothing in the future to be hopeful about	0	1	2	3
38	I felt that life was meaningless	0	1	2	3
39	I found myself getting agitated	0	1	2	3
40	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
41	I experienced trembling (eg, in the hands)	0	1	2	3
42	I found it difficult to work up the initiative to do things	0	1	2	3

Appendix D

Information Letter

*The Relationship between Nicotine Dependence and Symptoms of Anxiety,
Depression and Stress in a Therapeutic Community for Alcohol and other Drug
Rehabilitation
(Edith Cowan University)*

Dear Participant,

My name is Thomas Hopkins. I am conducting research on the relationship between nicotine dependence and symptoms of anxiety, depression and stress in a Therapeutic Community for alcohol and other drug rehabilitation. I would like to invite you to participate in my study, its findings may provide a better understanding of the relationship between smoking and mental health.

You will be asked to complete three questionnaires regarding personal characteristics, smoking, anxiety, depression and stress which should approximately take 30 minutes. Participation in this study is voluntary and you will be able to withdraw at any time. The information gathered will remain anonymous. The service provided to you will not be affected in any way if you choose not to participate in the study. No persons beside my supervisor and I will have access to the research data. Counselling services are available to all participants through Edith Cowan University Psychological Services Centre on 9301 0011, as well as a 24 hour counselling service through Lifeline on 13 1114. This research project is being undertaken as part of the requirements of an Honours program at Edith Cowan University.

Kind regards,

Thomas Hopkins

Appendix E

Letter of Approval

I have read through the proposed research and am fully aware of the nature and purpose of the research. I support the use of residents of Cyrenian House Therapeutic Community as participants in the proposed research. Whilst I would encourage residents to participate in the research, the service provided to residents will not be affected in any way if they choose not to participate.

Carol Daws

Executive Director, Cyrenian House

Instructions for Authors

The journal publishes work that is of direct professional relevance to psychologists or of general relevance within Australian psychology. This includes original contributions to scientific knowledge, state-of-the-art reviews of professional and applied areas and reviews and essays on matters of general relevance to psychologists, and manuscripts which address matters of general, professional and public relevance, techniques and approaches in psychological practice, professional development issues, and professional and public policy issues. Commentaries on matters arising from anything published in the journal may also be submitted for consideration for publication.

Preparation and submission of manuscripts

All submissions should be made online at Australian Psychologist's Manuscript Central site at <http://mc.manuscriptcentral.com/aps>. New users should first create an account. Once a user is logged onto the site submissions should be made via the Author Centre.

The journal operates a policy of anonymous peer review, hence all author information should be included in the covering letter, while the manuscript itself should be blinded (i.e., no reference to authors should appear anywhere in the manuscript). Papers will normally be scrutinised and commented on by at least two independent expert referees (in addition to the Editor) although the Editor may process a paper at his or her discretion. The referees will not be aware of the identity of the author. The text should be free of authorship clues as identifiable self-citations, e.g. "In our earlier work...".

Manuscripts should be between 4,000 and 7,000 words in length, excluding references, figures and tables, and authors should clearly note ON THE TITLE PAGE the exact word count of their manuscript, excluding tables, etc. In preparing manuscripts, contributors should follow the rules set out in the Publication Manual of the American Psychological Association (fifth edition). An abstract of no more than 200 words should be included. Note especially the proper style for references, both in the text and in the reference list. Tables should be typed one to a page at the end of the article, with notations as to their appropriate placement in the text. Diagrams and figures must be of a professional quality. A margin of at least 3 cm should be left on all four sides.

Spelling should conform to the Macquarie Dictionary (third edition, revised). For other matters of style and spelling, the Style Manual for Authors, Editors and Printers (sixth edition, Wiley) should be consulted. Manuscripts that do not meet these standards may be returned without review.

Authors are responsible for acquiring written permission to publish lengthy quotations, illustrations, etc. for which they do not own copyright.

Review of manuscripts

On submission you will be required to confirm that the manuscript has not been previously published and it is not currently under consideration for publication elsewhere. All contributions are handled by an appropriately qualified Associate Editor and all contributions are refereed.

Offprints

Corresponding authors can receive 50 free reprints, free online access to their article through our website (www.informaworld.com) and a complimentary copy of the issue containing their article. Complimentary reprints are available through Rightslink® and additional reprints can be purchased through Rightslink® when proofs are received. If you have any queries, please contact our reprints department at reprints@tandf.co.uk

Copyright Details

About this Journal

[Aims & Scope](#)

[Abstracting & Indexing](#)

[Editorial Board](#)

[Related Websites](#)

[For Contributors](#)

[Online Submissions](#)

[Instructions for Authors](#)

[eJournal](#)

[Free Sample Copy](#)

[Online Contents](#)